

wisconsin architect

july-august / 1967

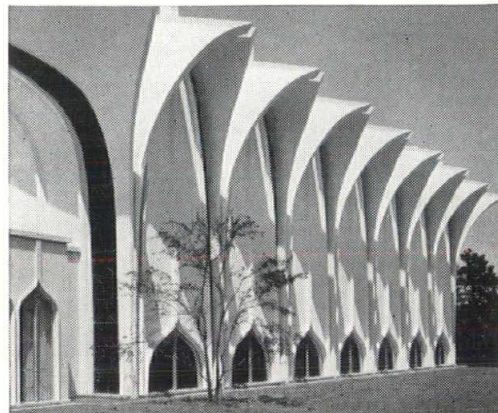
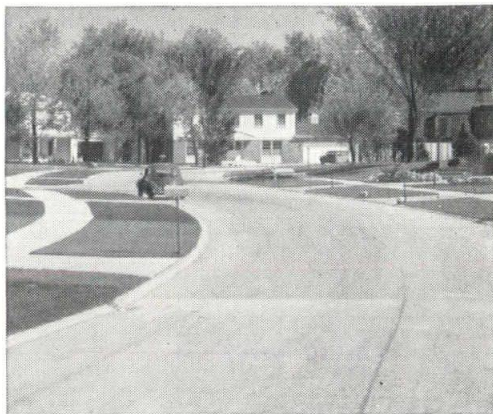
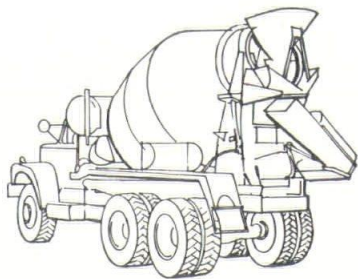


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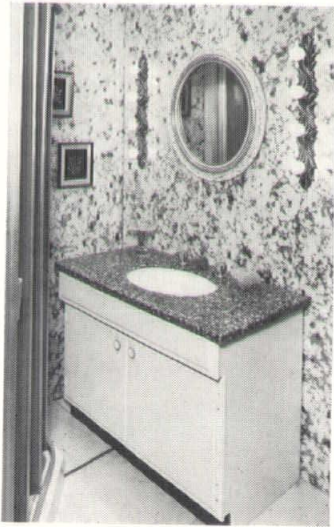
There are as many kinds of concrete today as there are uses for this versatile material. From soaring shell roofs to driveways, each type of construction calls for a particular mixture designed for the job. The building industry counts on ready-mix producers to provide the high quality concrete needed . . . a precision mix for the job every time. This year, more than 150,000,000 cubic yards of concrete will be delivered to America's building sites. Ready-mix producers, as well as all users of concrete, receive valuable help from PCA. Technical information, up-to-date research data and quality control methods developed by PCA are provided free of charge through 38 field offices in the U.S. and Canada.

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An organization to improve and extend the uses of portland cement and concrete

Glamour Lighting

for the Home

Spectators at the recent Home Show in Milwaukee were treated to a brilliant display of modern lighting for the home. Six model room vignettes were used to demonstrate the latest in interior lighting application. The exhibit was conceived and sponsored by the Electrical Contractors' Association, Milwaukee Chapter, as part of its continuing effort to present the latest advances in business, industrial and home lighting.



Theatrical lighting in classic styling dominated the bathroom display. Also shown was a unique, built-in overhead fixture which served as a heat lamp, sun lamp and fan.



Dining room offered a dramatic "gallery wall" with spotlight fixtures to illuminate paintings. Ceiling spotlights brought out the sparkle of crystal and silver. The fixture above the table dimmed to provide a romantic candle-glow effect for dining.



Mood lighting was again featured in the bedroom display, with concealed fluorescent lighting installed in the canopy over the bed. Individually controlled down lights for reading in bed were also demonstrated.



Model greenhouse demonstrated use of automatic "grow-lite" which turns on when daylight fades and turns off when daylight returns.



Application of "mood lighting" was the feature of this living room display. A bank of concealed cornice lighting bathed the draperies in changing intensities of light and color. Table lamps and fixtures also dimmed and brightened for varied effects.



Model kitchen featured canopy lighting above work area, and a luminous ceiling that was shadowless and glare-free.

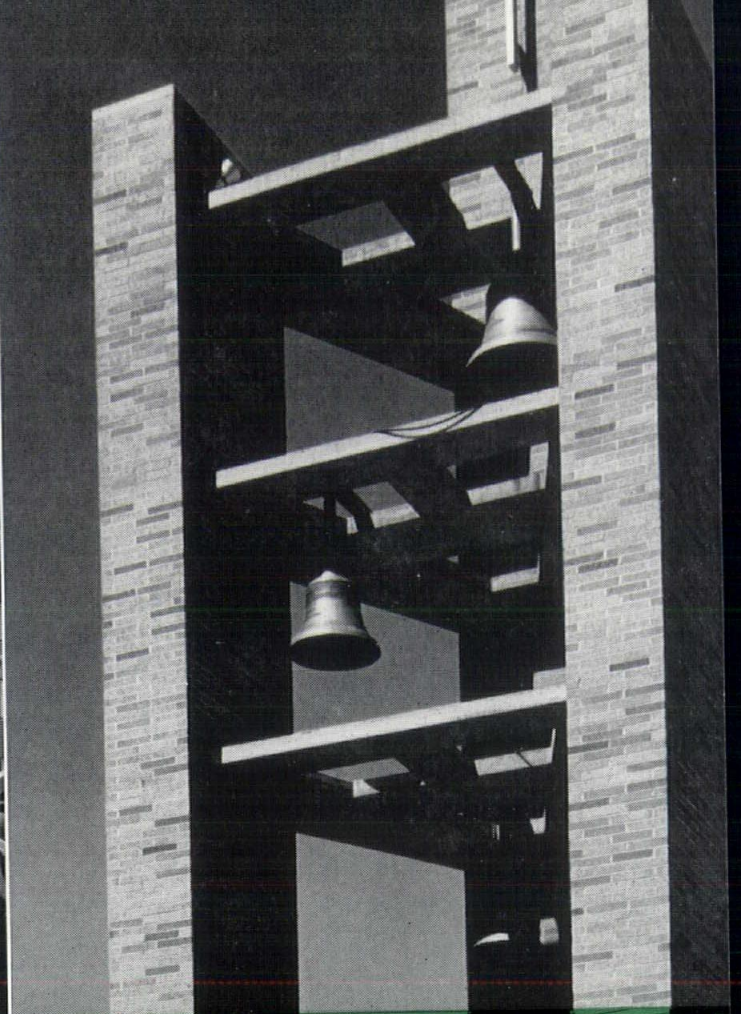
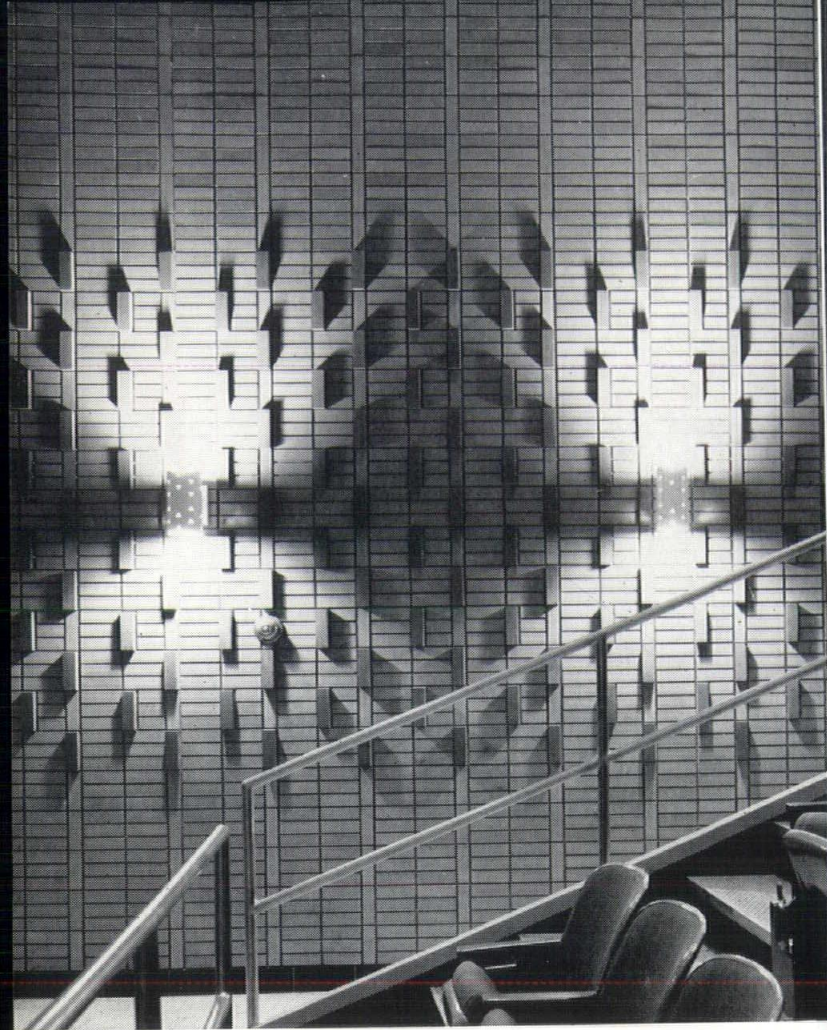
ELECTRICAL



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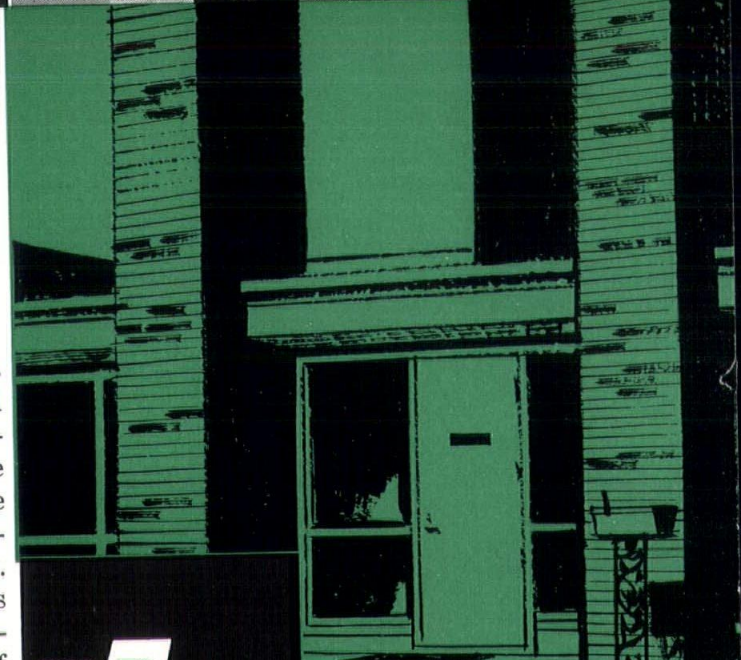
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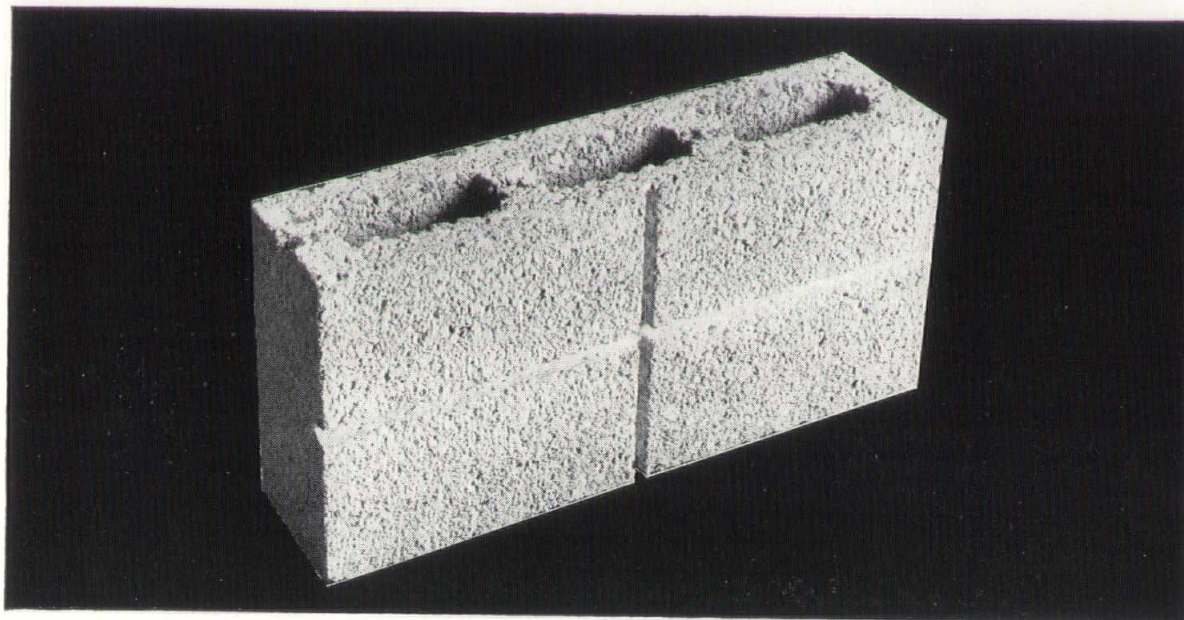


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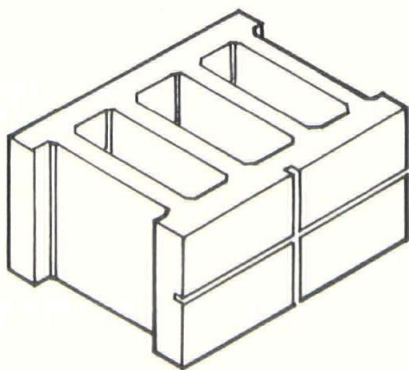
BEST'S BLOCK OF THE MONTH

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JUST ANOTHER WAY IN WHICH BEST BLOCK WORKS WITH THE
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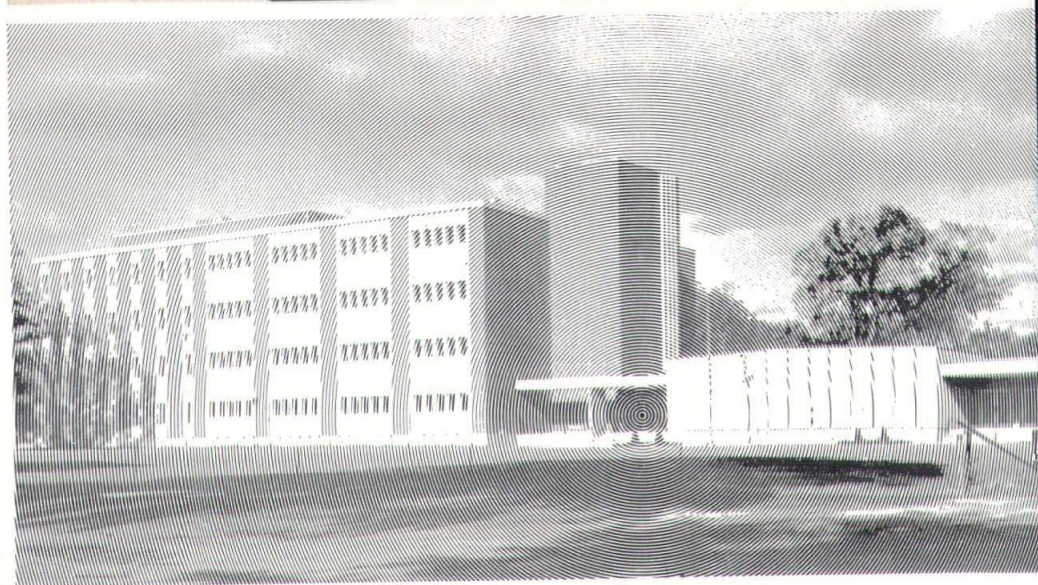
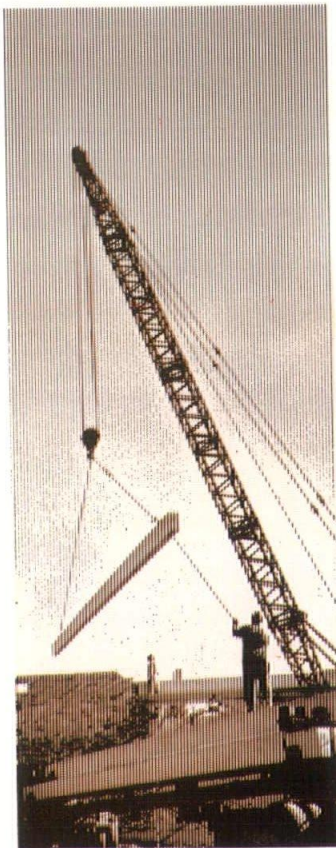
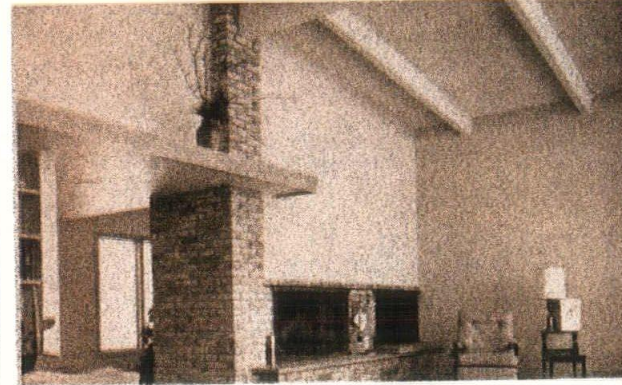
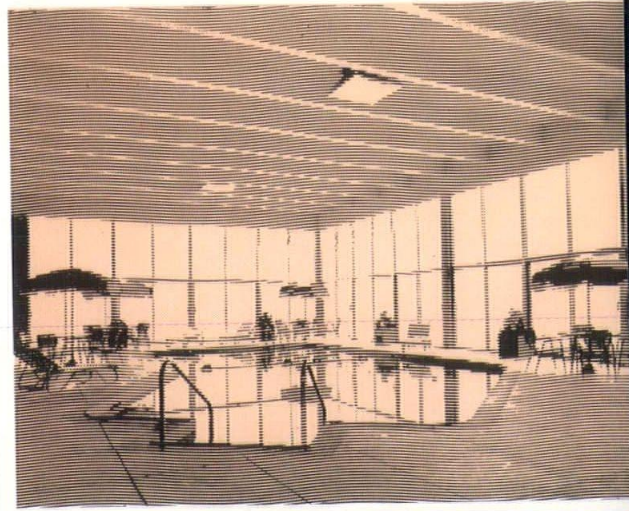
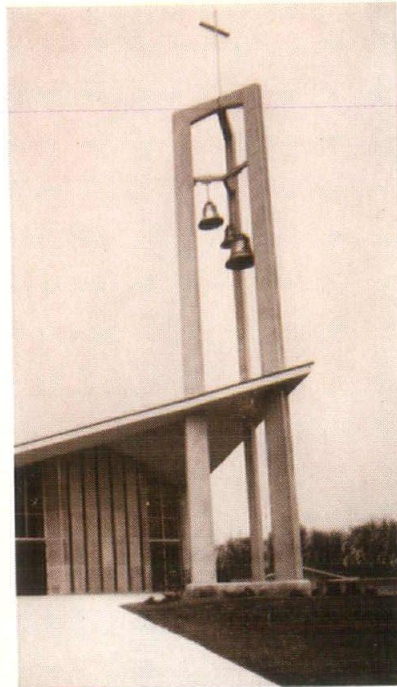
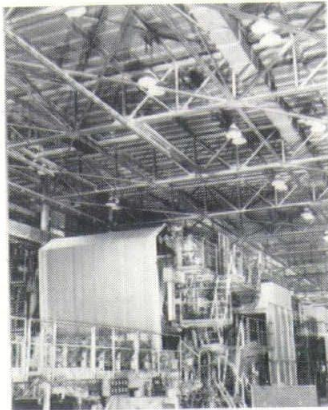
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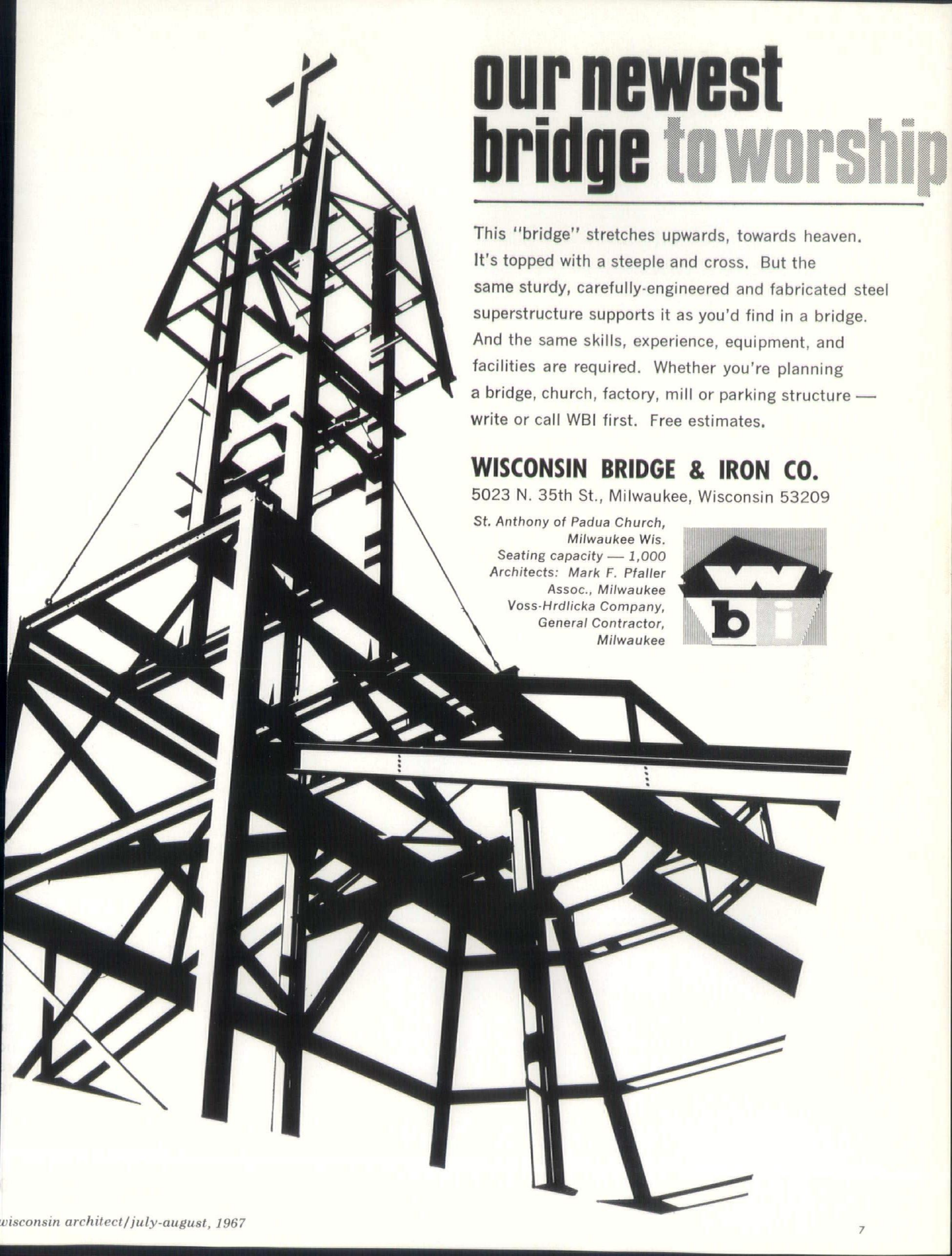


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between the Herman Andrae Electric Company and the first telephone

About six years, to be precise.

That's right, Andrae Electric came into being just six years after the telephone was invented. The firm currently is celebrating its 85th year of continuous operation. This makes Andrae the oldest electrical contractor in the country . . . perhaps the world.

There's a difference...

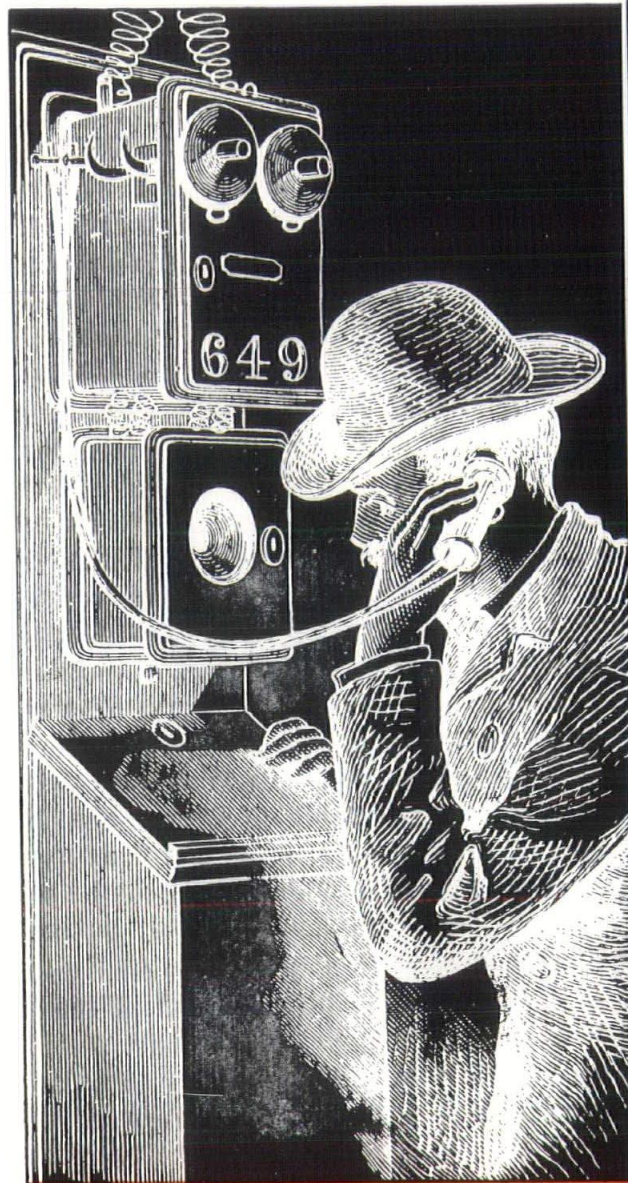
Between electrical contractors too. Every architect is aware of this . . . and every responsible architect wants to have specific questions answered before requesting an electrical contractor to bid on a job. Based on our experience, these are the questions:

- Is the contractor financially responsible?
- What is the contractor's current work load and manpower situation?
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- What is the calibre of the contractor's work?
- Does the contractor offer a fair and equitable price . . . and stick to it?

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- Andrae Electric has open lines of credit at major financial institutions in the area; Andrae can obtain a performance bond of any size.
- Andrae maintains a work force of over 100 people.
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- Andrae adheres to quality standards that have survived the abrasiveness of time, the impatience of people and the test of continued performance.
- Andrae's price is based on fact . . . experience . . . and knowledge of the business. Andrae "installs" a job . . . it does not "throw one in." As an architect, you know the difference.

***Is there a difference? You bet...
and between us, as the saying goes...
"Viva La Difference!"***

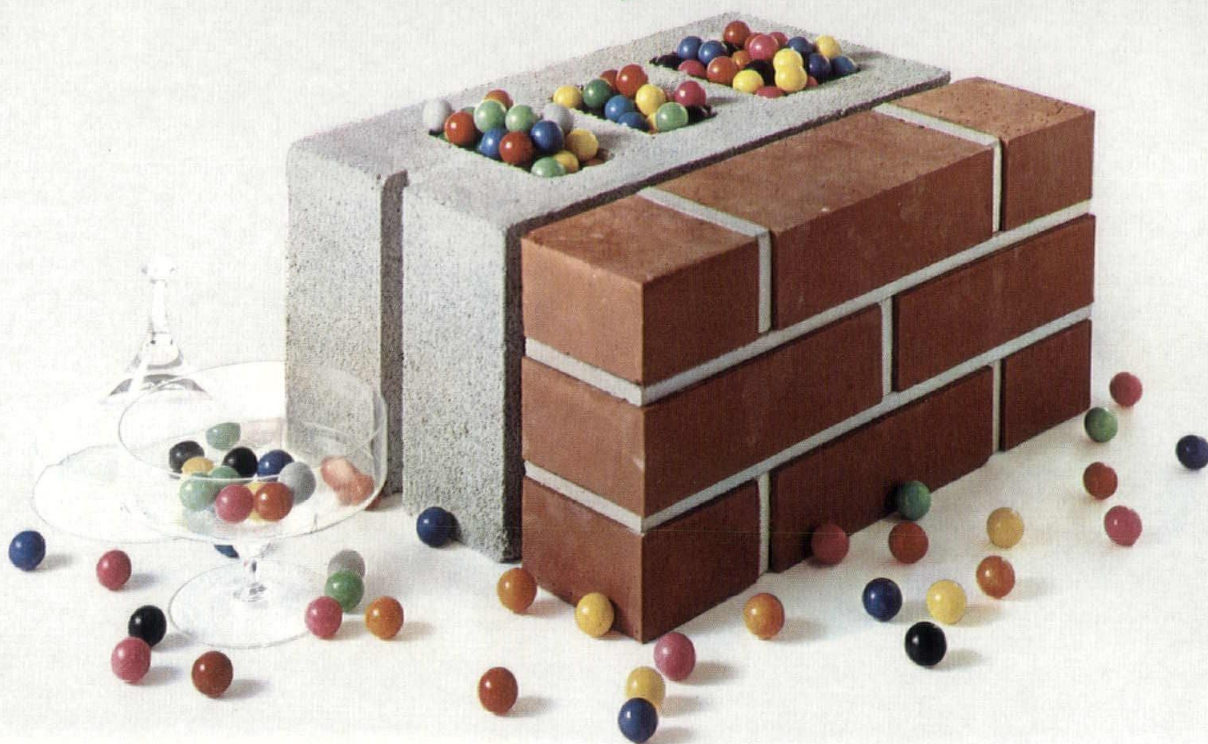


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How about jawbreakers?



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Zonolite Masonry Fill Insulation was developed specifically for these kinds of walls. It doubles their insulation value; a real boon to mankind. Keeps inside wall temperatures comfortable and the heating and air condition-

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Zonolite pours right into the voids, fills them completely, never settles. It is water repellent; any moisture that gets into the wall drains down through it and out.

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Gentlemen:

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THE INTEGRATED CEILING OF THE FUTURE

The terms "versatility" and "flexibility" have become so hackneyed by advertising men in their description of almost any product today, that the frequent reader of such advertising is hard-pressed to suppress a smile when he runs across these terms in the copy written about some new product. Few products in our industry seem to rely on these terms more than the integrated ceiling system and the rash of manufacturers now rushing to get into this field. Some manufacturers seem to feel that their system is "flexible" if they can merely interchange a ceiling tile and a light fixture in a given suspension module, while others feel that the ability to arrange the light fixtures or the tiles in various vaulted or flat patterns as being worthy of the term "versatility."

With these and other similar adjectives being heaped upon the architect almost daily, we decided to conduct an informal survey among a few Wisconsin architects to find out what they would like to see in the Ceiling of the Future; a ceiling where adjectives like "versatile" and "flexible" would have some real meaning.

The characteristics of this Ceiling of the Future would be difficult to list in any particular order since the individual architects had such strong feelings regarding what they considered to be the most important aspect, and they did not all agree on which of the following items should be considered the central point. Again, while most architects started by saying that they wanted a complete freedom of design choice, so that their ceiling would not look like any other ceiling in any other building, some of these same men would finish the conversation by hoping for a manufacturer who would detail a standard, easily-specifiable ceiling. Surely, a paradox! Then, in no particular order, here are the characteristics of the Ceiling of the Future.

1. A truly variable module size. Not just 2' x 2', or 4' x 4', or 5' x 5' — but 4'4" square, or 5'2" x 2'7", or varying module sizes within a given space to relieve monotony, or any other size or shape he might choose, without a cost penalty.

2. A system that will allow him to have a flat ceiling, or a vaulted ceiling, or a flat ceiling with regressed slots, or the new Cove-Vault or Modular-Cove ceilings.

3. All ceiling members will be made of extruded aluminum or other extruded metals to allow a full choice of the shape and the design of the ceiling members or ceiling slots, again without the cost penalty. Some architects envisioned hard-coat anodized members for the new idea of swimming pool dropped ceilings, or color anodizing of the bars, and one architect wanted extruded bronze members in a rather deluxe project while only paying the basic metal cost difference between the standard extrusions and the bronze.

4. A choice of heavy duty or light duty extrusions, again of aluminum, to allow for high structural strength without the usual weight penalty.

5. A ceiling system that could be varied in its design to fit the very lowest budget job, and yet, with another design adaptation, to fit the most monumental structure of his career.

6. A ceiling where all of the air distribution will take place through slots in the suspension members without the penalty of unsightly air deflectors hanging below the ceiling or without having to go to a "double-slot" bar.

7. A choice of various slot widths and a ceiling that can be made up of a combination of slots and solid tees, or all slots.

8. A ceiling where light fixtures of almost any size, shape or design can be used from almost any manufacturer.

9. A ceiling where the acoustical tiles can be selected from products of several manufacturers and still all fit perfectly into the suspension members.

10. A ceiling where all components can be bid and installed through the ceiling contractor for a single source of responsibility, or at the architects option on another project, can have its components split among the various trades.

11. A ceiling where the air distribution can be either a continuous duct mounted on a main runner or through individual "boots" attached with flexible duct to the main duct, and yet where the air, at any point, can be directed from one-way blow to two-way blow, to down-blow or to any point in-between with varying volumes, velocities and even throws — all adjustable through the slot without changing the appearance in any way.

12. A suspension system which would allow partitions of any width to be mounted directly under its members without disturbing the air pattern from a slot or the acoustical integrity of the assembly.

Certainly, for this dream Ceiling of the Future, the advertising man's description "flexibility" and "versatility" could easily be used in good faith. More astounding than any of the characteristics outlined above is the fact that this Ceiling of the Future already exists today! A combined effort by the sister companies of Titus Manufacturing Corp. of Waterloo, Iowa, the world's foremost manufacturer of air distribution devices, and Titus Metals, Inc., a manufacturer of high quality extrusions for many industries, have made all of the above, and even more, available today. They call it "T-LINE."



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*today's first
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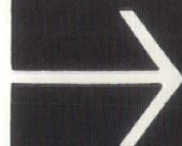
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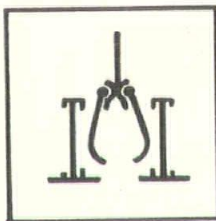
the NEW T-LINE AIR DIFFUSING / CEILING SUPPORT SYSTEMS by TITUS[®]

• Furnished in 2 basic types — Modular T-Line and Linear T-Line

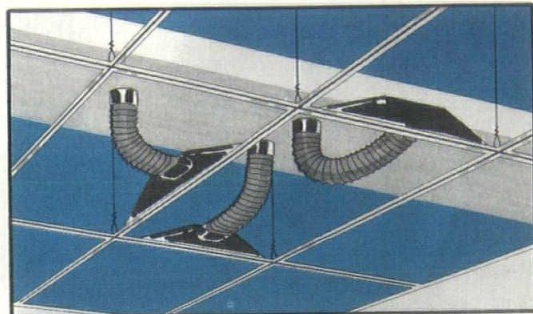
Another Titus first! An architecturally-engineered ceiling support system which not only provides today's most efficient, most versatile air distribution — but into which can be incorporated the lighting, acoustical control and partitions to fit the specifications on any type ceiling application.

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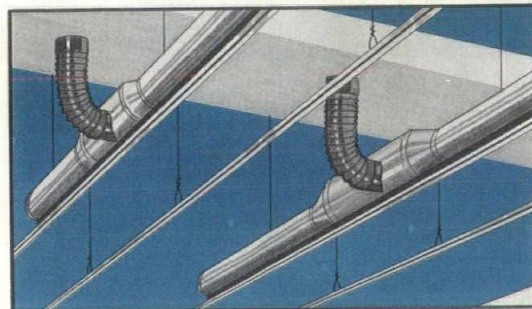
- **PERFECTION OF AIR DISTRIBUTION THAT CANNOT BE MATCHED BY ANY OTHER SYSTEM!** The new Titus T-Line features linear air diffusing vanes which provide tremendous versatility in handling air — give the necessary air patterns and air flow rate control to fully satisfy any present or future room requirements. With these vanes (which easily install in Main-T and Cross-T Sections, and are an integral part of Titus-Engineered Plug-In Diffusers) air pattern is adjustable a full 180° — from horizontal discharge, left or right — to a vertical discharge — or any pattern in between. The same set of vanes provide complete air flow rate control, including blank-off.



- **GREATEST VERSATILITY OF ANY CEILING SYSTEM.** The special design of the new Titus T-Line System permits the flexibility to meet any ceiling requirement in any size or shape space. Allows greatest freedom in selection of lighting, acoustical panels and partitioning — all of which can be totally integrated into basic modules of any size desired.
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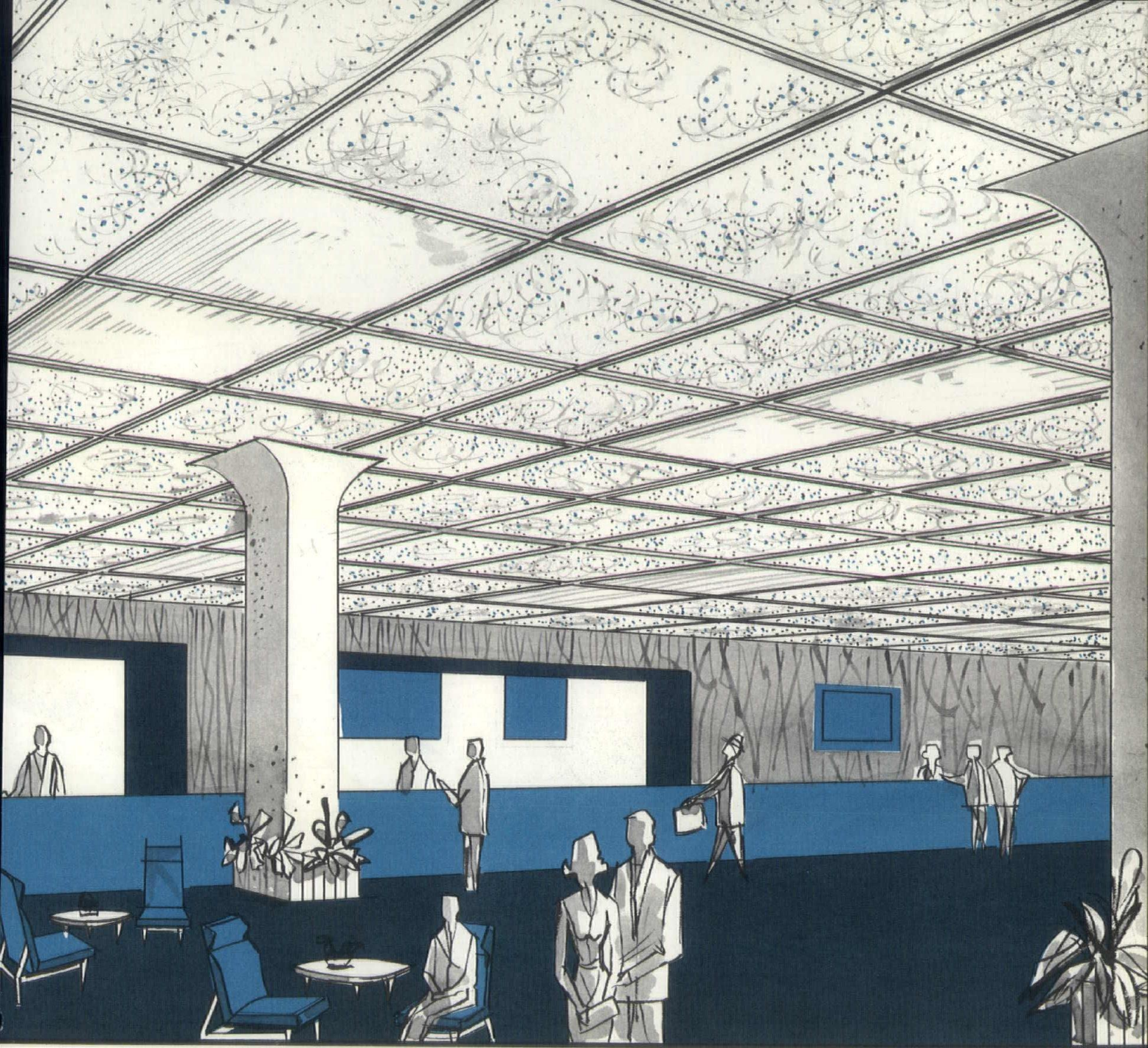
Titus Engineered Diffusers simply plug into Main-T and Cross-T support members. Easily relocated at any time — to meet future requirements — without disturbing other ceiling functions.



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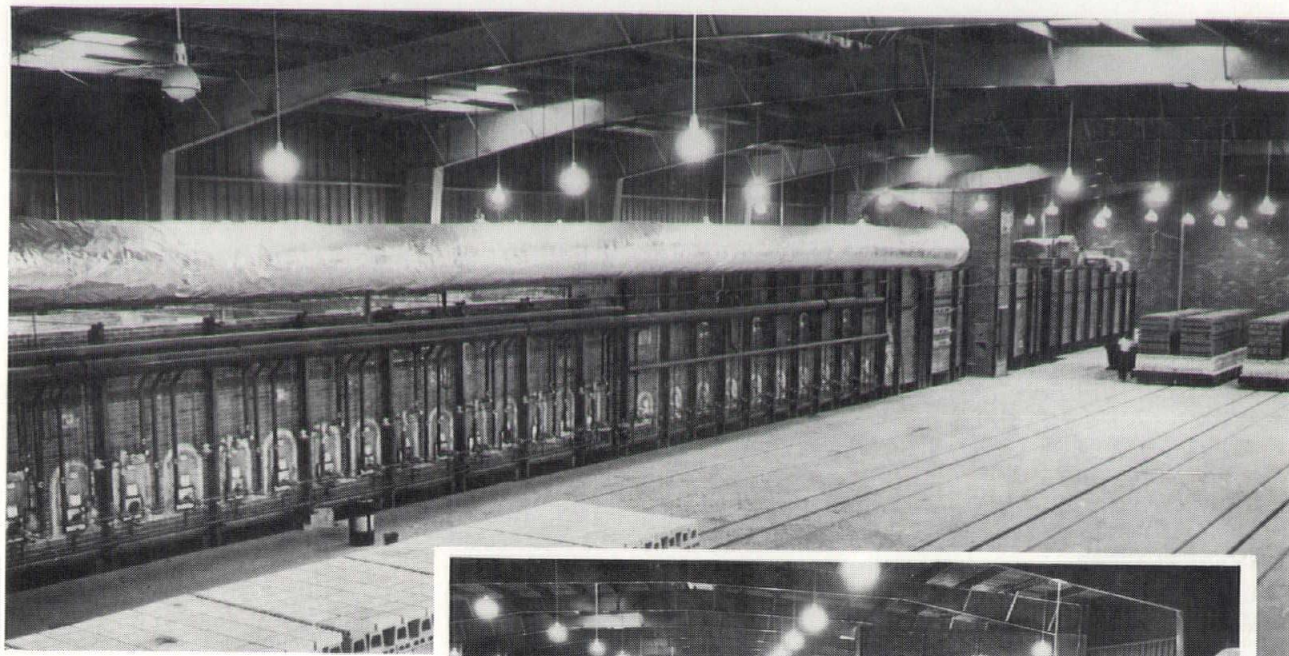
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Now, as never before, architects can fully satisfy the aesthetic function of linear ceiling design! And with Linear T-Line which features Main-T runners that can be used in conjunction with many other types of complementary support systems, there is flexibility of air distribution, lighting and acoustical control for maximum environmental control — even on a rigid area by area basis.

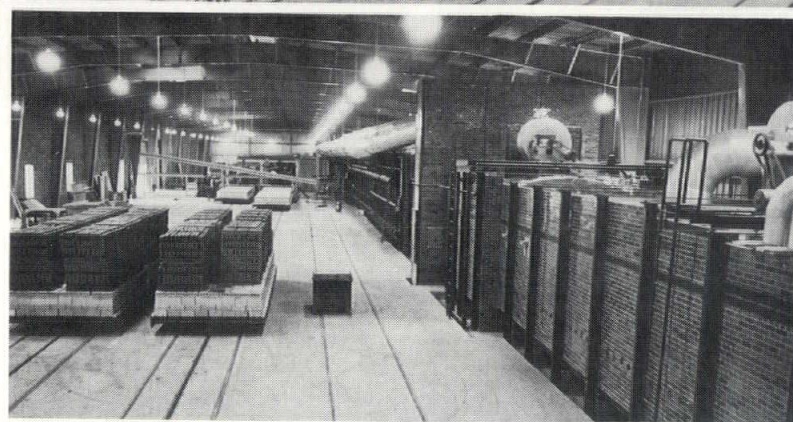
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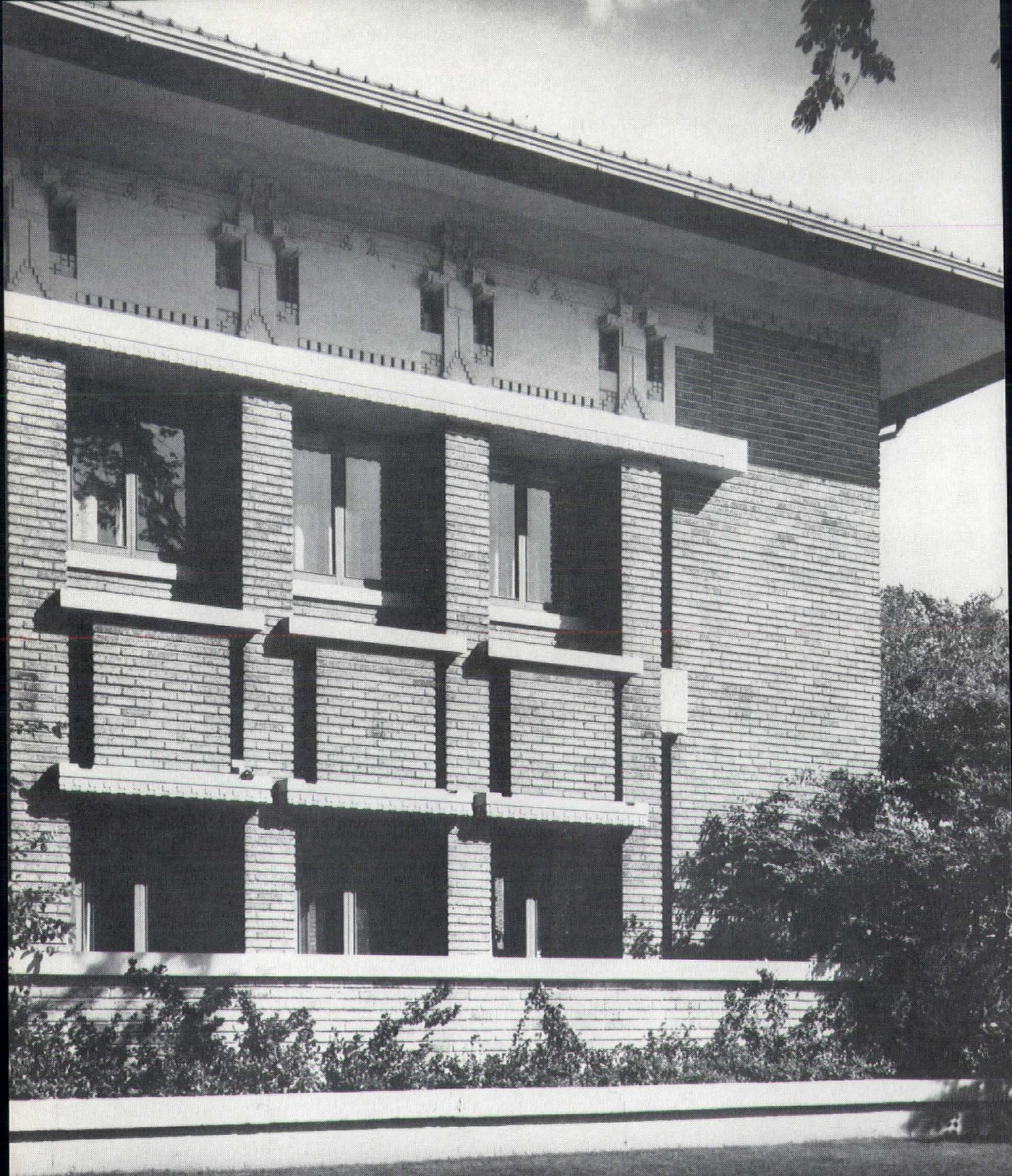
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Considering the month of July and August as vacation time, the Publications Committee of the Wisconsin Chapter, A.I.A., has thought it in the best interest of those concerned that we publish a double issue for these two months. We will resume our monthly schedule in September.



The architecture of the mayas

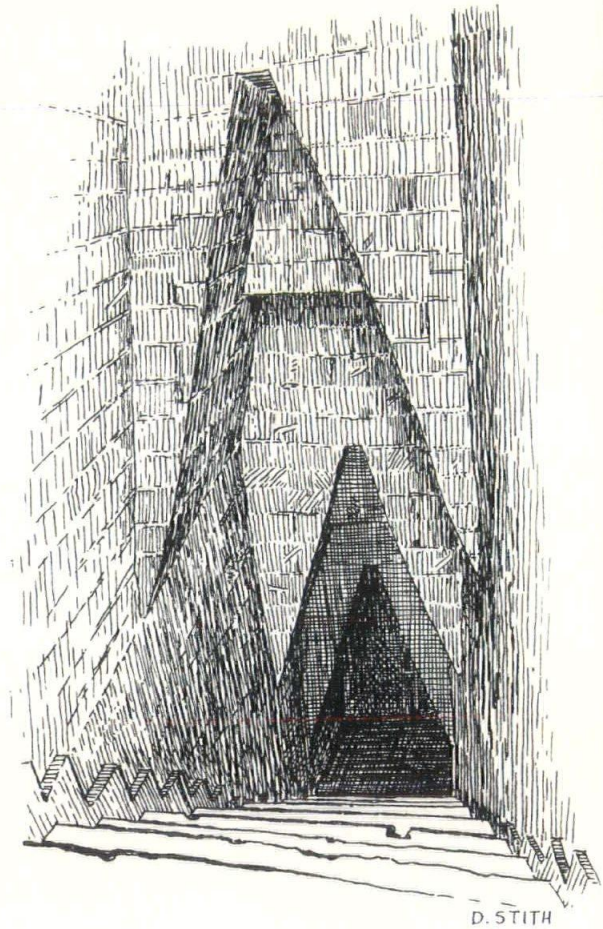
by Dick J. Stith

Palenque, Chiapas, Mexico

The Mayan city of Palenque is located west of the Usumacinta River in present-day Chiapas, Mexico. Situated high in the foothills of the Sierra of Chiapas mountain range, the city overlooks the plains of Chiapas to the north. Immediately south of the city is a mountainous and heavily wooded rain forest.



Four story Palace Tower at Palenque. The first floor is a solid mass of masonry. The inside stairway goes from the second to the fourth floor.



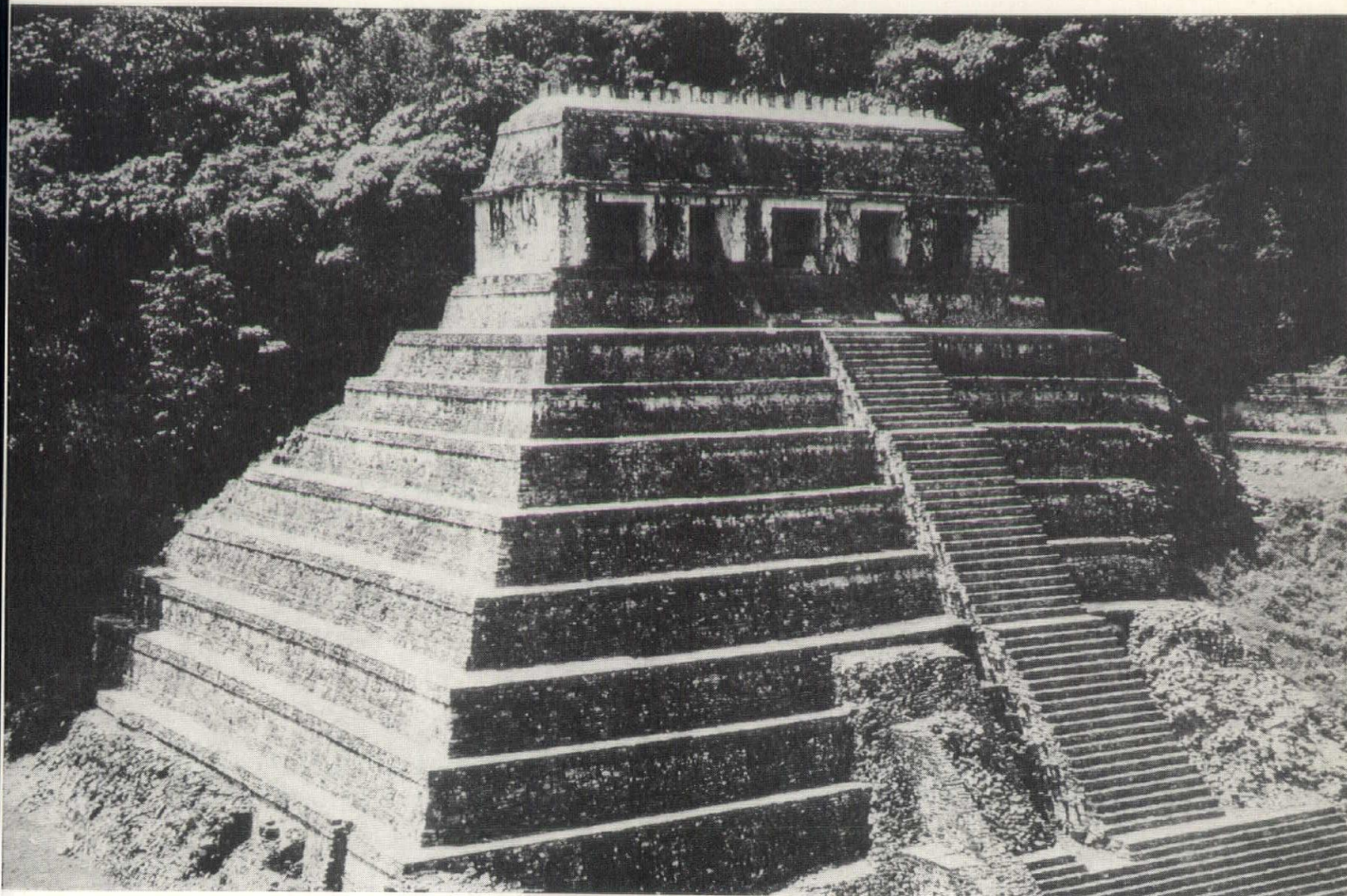
D. STITH

Looking down the interior stairway leading to the crypt in the Temple of Inscriptions.

Palenque was the center of the arts and architecture of the classic period (300 A.D.-900 A.D.) and one of the westernmost centers of the Mayan area. It reached its height of development during the sixth and seventh centuries, though it was probably occupied until 900 A.D. Judging by the size of the city and the surrounding area, it may have had a population of 100,000 at its peak.

A chief characteristic of Palenque is the spaciousness of the city as well as the spacial concepts of the buildings. Open space and the feeling of space must have been a keen desire of the planners. An outstanding feature of Palenque is a small river, the Otolum, that runs through the city. A corbel-vaulted underground aqueduct allowed the city to build over the stream so that the plazas and courtyards were uninterrupted. This achieved a unity of space, avoiding the visual as well as physical separation which the stream would have caused.

The Mayas never featured water as a design element. Yucatan is a low country, without rivers, and the highest elevation is just 300' above sea level. In the area



Exterior of the Temple of Inscriptions, Palenque, Chiapas, Mexico.

from northern Guatemala to the Gulf of Mexico water was collected in large cisterns or drawn from natural wells, called cenotes. In the Peten Lake region, valleys were actually paved to collect rain for water supply. Cities along the Usumacinta and Motagua Rivers were assured of a water supply, but the city designers did not use the rivers as design features.

At Palenque, the use of open volumes, height, and various levels of terraces creates a strikingly formal yet varied environment. Today it is difficult to identify the functions of the various platforms and buildings but one is very aware of the keen sense of order. The size, position and elevations given to the buildings all indicate the planners of Palenque were highly skilled.

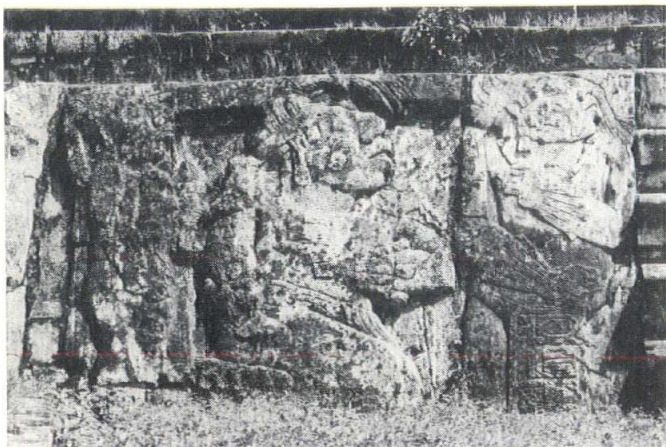
The Mayas evidently lacked faith in stone for lintels, and used wood almost universally for lintels and for tie beam reinforcements for their vaults. Sometimes wood beams were laid and completely covered with masonry to create flat ceilings. So far as is known, only three vaults exist where stone was used for the vault ties. All three are in Palenque: the underground aqueduct, the stairway ceiling and the tomb within the Temple of Inscriptions.

By far the most common method of building a corbelled vault was to project the first stone above the spring line inwardly. These projections vary from 1/2" to as much as 5" and from this point each ascending course of stone slopes or steps inwardly to a point just below the ceiling cap stone. (One popular theory for this method of building vaults is that the projection enabled removal of wooden forms used in constructing the vault.) At Palenque, however, belt courses just below the spring line are common and the surfaces of some vaults are plastered to give a more uniform surface.

The interior height of Mayan vaulted chambers, from floor to ceiling cap stone, is usually equal to, or slightly greater than, twice the chamber width. The most common method of passage from one vaulted chamber to another was an opening through the bearing wall. At Palenque the connections between chambers opened up into the vault zone creating a transept effect. These "transepts" create a remarkable feeling of spaciousness even though the rooms are rarely wider than eight feet. Some of the Palenque vaults have deep "key-hole" shaped coffers which break the monotony



Sunken courtyard in the Palace of Palenque as seen from the third floor of the tower.



Close-up of bas-relief stone figures in the sunken courtyard.

of the otherwise uniform surface, lighten the weight of the vault, and may well have been intended to hold sculpture.

Few buildings in all Maya exceeded three stories. To carry the extra load superimposed by upper stories, the wall thicknesses on the ground floor of multi-floored buildings were increased to a point where they practically closed the rooms. In some cases the ground floor was a solid mass to carry the second floor, giving only the appearance of a multi-storied building.

The four story tower at Palenque has its first story completely filled; however, an inside stairway leads from the second to the fourth floor.

Inside stairways are rare. At Uaxactun only three inside stairways have been found, and at most other cities no inside stairways were built.

The Palace at Palenque has four interior stairways; one in the tower and three others leading from the palace to subterranean chambers. The most unique stairway at Palenque is the stairway in the Temple of Inscriptions. This stairway originates within the temple some 75 feet above the ground level and continues down through one landing to the Ruz Tomb 80 feet below the temple floor.

The Temple of Inscriptions is a vital link in Mayan Civilization; it contains the longest known series of Mayan hieroglyphics and is the only temple containing a burial chamber. In contrast to the usual practice of

plastered floors, this floor is of stone slabs without any sign of ever having been covered with plaster. Close examination of the floor shows evidence of incised inscriptions.

In 1949 Alberto Ruz was studying this particular temple and removed one floor slab which had three plugged holes at each end. When it was lifted and some rubble removed, the outline of a stairway appeared. Apparently no one before Ruz had noticed that the walls were outside the floor line and continued downward. During the next four seasons (2 to 3 working months each) the rubble was slowly removed from this stairway to discover what lay underneath. On June 15, 1952, a large triangular door slab was removed and the tomb was viewed for the first time since being sealed thirteen centuries before.

The burial chamber is a room about 10' wide, 30' long with a ceiling 22' high. On the floor was a richly carved stone slab 7' x 12' and 1' thick. This slab was lifted and the crypt directly below contained the remains of a man, evidently of high rank, and one for whom the temple was built.

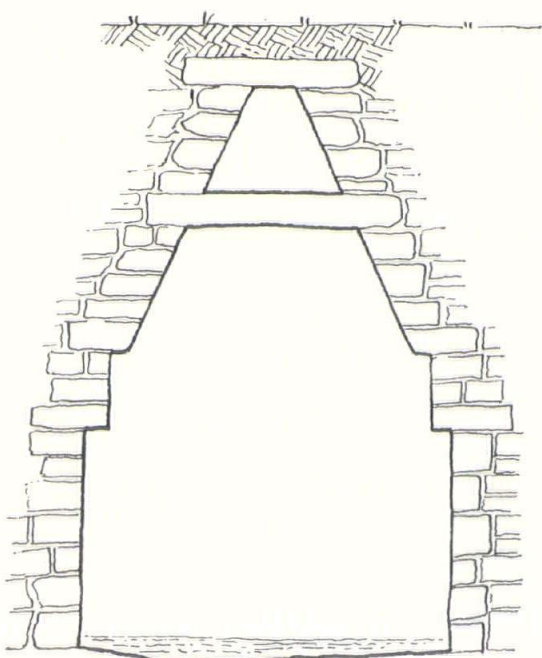
There was no gold in the crypt. The buried man had a jade ornament in each hand and one in his mouth; his shoulders and neck were covered with a huge collar and a breast ornament of jade beads. His face was covered with what is the now famous "Palenque Mask" made of jade mosaic. (This mask is now in a museum in Mexico City.)



Interior of one of three subterranean chambers in the Palace of Palenque. The ceiling vault is similar to vaults used in early classic graves and structures in the eastern Mayan area.



Above: Panel in the Temple of the Foliated Cross.



Left: Cross section through the underground aqueduct at Palenque. Width of span is approximately 7 ft.-0 in.

The three stone tablets in the Temple of Inscriptions, one centered on the wall of the center chamber and the other two flanking the door to the center chamber, contain 620 hieroglyphics. They cover a series of dates embracing a period of 200 years. The date which corresponds to this temple is 692 A.D.

The Palace, at Palenque, is a rather complex group of buildings connected to form a remarkable structure, some 300' long and 240' wide. The exterior and interior walls were lavishly decorated with stone and stucco reliefs picturing human figures, masks, and hieroglyphs. Within the building are a number of courtyards completely surrounded by palace rooms. These courtyards enhance the adjoining rooms and create a certain degree of grandeur not generally associated with interior space of Mayan palaces. One courtyard is sunken and has stairways on all four sides leading down to the ground level. The west staircase is flanked by huge (6' length) stone figures with the figures on the right facing the



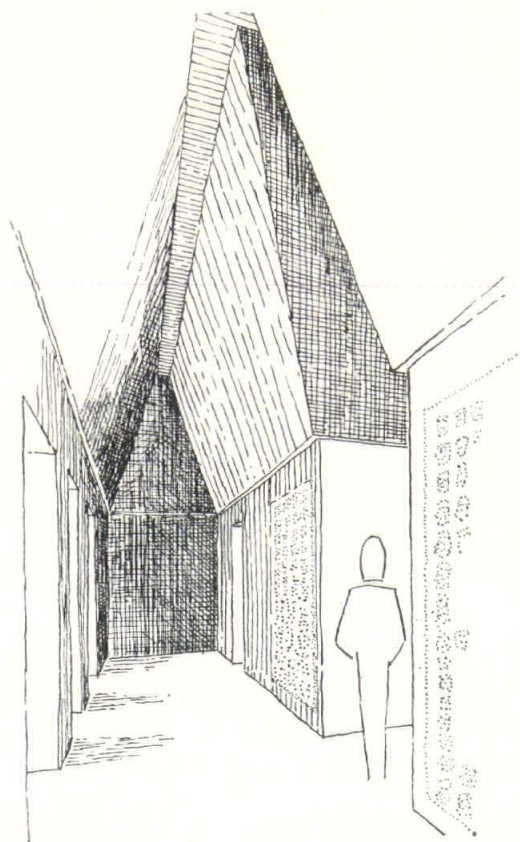
Interior of the Ruz Tomb in the Temple of Inscriptions, discovered by Alberto Ruz in 1952. The room is about 10 feet wide, 30 feet long with a 22 foot ceiling.

stairs while those on the left face away from the stairs except for the one individual adjacent to the stairway.

Within three of the palace courtyards, stairways lead to three subterranean chambers, or galleries. These galleries are completely dark and their intended purpose is unknown. Possibly they served for religious ceremonies.

One of the real delights at Palenque is the Temple of the Foliated Cross. The ruins of the Temple are almost enshrined by the rain forest. Even from a short distance this little Temple is so nearly obscured that one cannot imagine the magnificent carved panel inside the shrine. The panel is about seven feet wide, six feet high and depicts priests, or noblemen, paying tribute to the Sun-God. A similar panel is contained in the Temple of the Sun, just west of this temple, however, the Temple of the Sun has a most impressive exterior.

Palenque was for centuries the center of art and architecture as well as the ceremonial and governmental center for hundreds of Mayans. The quality of their buildings and the competence which the ancient artisans demonstrated, indicates that some type of training was necessary. Possibly the Mayans practiced some form of apprenticeship. Whatever their methods of training, master architects, designers and craftsmen evolved from their civilization.



Interior of the Temple of Inscriptions showing "transept" opening to the central chamber.



Temple of the Foliated Cross enshrined by a rain forest.

Dankmar Adler

The Man, The Architect, The Author

by Joan W. Saltstein

Part One — The Man

Who was Dankmar Adler? Here in Wisconsin he is often confused with a Midwestern architect of the same last name to whom he bore no relationship. Even the most highly credited architectural historians refer to *Sullivan's* Wainwright Building and even to Sullivan's Chicago Auditorium although these buildings



were built during the partnership of Adler and Sullivan, and the Auditorium was largely designed by Adler alone. Why should this be? The question often puzzled my mother who was Dankmar Adler's daughter and to this day I find myself vehemently taking up the cudgel when my grandfather's contribution is all but ignored. The answer may lie in the fact that Sullivan was a more colorful person, his contribution more visual, his writings more poetic, his life span longer. A cult has developed around him, the romantic, mysterious prophet of the new architecture. But Dankmar Adler in his own right made an enormous contribution to his profession as an architect, an acoustical and structural engineer and an author of historic legislation. Modest to a fault, he promoted the career of his brilliant young partner and remained in the background. In these articles I shall attempt by using original materials, some never before published, to put him in his proper perspective.

The town where Dankmar Adler was born in July 1844 was called Stadt Lengersfeld and lies not far from Eisenach in Saxe Weimar just across the border of what is now the Eastern Zone of Germany. At the time of his birth it numbered about 2000 residents. Dankmar's father, Liebman, was a rabbi and cantor in the local synagogue and in addition was head of a communal school which was among the first to include both Christian and Jewish children in its enrollment. His mother had died in childbirth at the age of twenty-three and the sorrowing father named his infant son, Dankmar, which is a composite word of the German Dank-thanks and the Hebrew-Mar-bitter. We have no indication that his sad name in any way shadowed Dankmar's life, for two years later Liebman Adler married a woman with the charming name of Zerlina Piccard and he grew up in a happy home with thirteen



Adler House

half-sisters and brothers. He could not have suffered the trauma of a stepchild for he adored and was adored by his stepmother throughout his life.

In 1854 the Adler family migrated to Detroit where Liebman was appointed rabbi of Temple Beth El. In those days a preacher's salary was extremely meager and Zerlina made bonnets for her neighbors to augment the family income. In a notebook which Dankmar carefully kept while he was in high school he listed his "dues" for chores completed at about six cents a day. He meticulously recorded "how D. Adler spends his time in school" and listed all the books he read together with "those he might have taken" and "those he could not help taking" in a ratio of 11: 2: 2.

Dankmar failed in his entrance examinations to the University of Michigan because, as he says in his unpublished autobiography, "he undertook to prove to the examining professor that his use of fractional and negative exponents was altogether erroneous and not in accordance with my matured ideas of the mathematical proprieties."

After a brief and unsatisfactory excursion into the mercantile business, he studied freehand drawing under the tutelage of Jules Melchers, the father of the artist Gari Melchers, who, I have been told, was the originator of the figure of the cigar store Indian. Dankmar refers to Melchers as a very clever modeler and sculptor who encouraged his interest in architecture to such an extent that he was finally apprenticed to a local architect, John Schaeffer. Mr. Schaeffer was apparently a man of questionable ethics and with eccentric views on the history of architecture. "Among his teachings," according to his pupil, "was one to the effect that our ancestors in erecting buildings devoted to the worship of God designed them in a manner or style intended to illustrate by an upward tendency of lines and structure of ornament their aspirations toward God and that this style so developed was therefore called 'Goddick.'" Having "grown tired of this sort of thing," Dankmar withdrew from Schaeffer's office and entered that of E. Willard Smith, who, under a stiff regime of 12-16 hours a day, was able to teach him architectural history and design and to lay the foundation of whatever actual knowledge of the profession he may have acquired (this again according to Dankmar's autobiography).



Birthplace of Dankmar Adler



Dila and Dankmar Adler

In 1861 Rabbi Adler was called to the pulpit of KAM (Kehilath Anshe Mayriv) Temple in Chicago where he served as rabbi until his death, nearly forty years later. Dankmar found employment in the office of an architect named Augustus Bauer for a short time but on his 18th birthday, inspired by the abolitionist sermons of his father, he joined the First Regiment of the Illinois Light Artillery and served in many of the bloodiest battles of the Civil War. Dankmar's military career proved to be a large factor in his education. When the Southern mansions were looted, he would take the opportunity of carrying off scientific and historical books and hiding them in ammunition chests. He added to his education by reading these spoils which in later years he assured his indignant family would have been burned if he hadn't made off with them. During the last nine months of his military career he was detailed as a draughtsman in the Topographical Engineers' Office of the Military Division of the army where under the guidance of a distinguished civil engineer, Milo Burke, he studied the great engineering problems incident to the war. When he was discharged he could say, "I had made as good use of my time and was as well equipped for my life work as if my studies had been pursued at home."

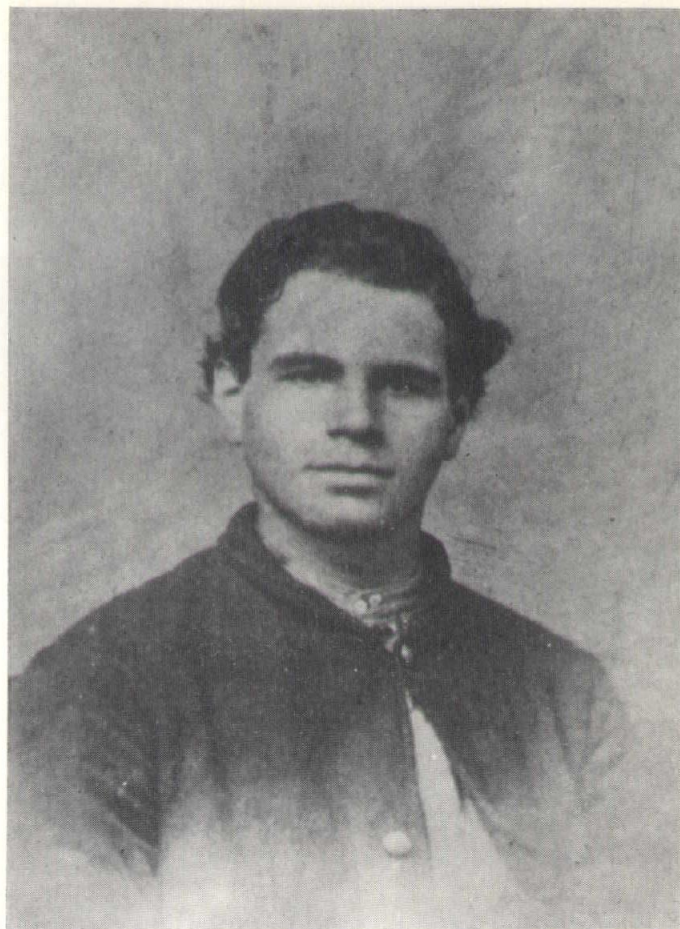
Dankmar returned to Chicago at the close of the war and reentered Augustus Bauer's office, ending that association when he could no longer stand Bauer's sneers at his military career which the older man con-

sidered a waste of time. He then joined the firm of A. J. Kinney who was principally an architect of churches, schools and courthouses throughout the Middle West. But his real career began in 1871 when he became the partner of Edward Burling. The great Chicago Fire had opened up unequalled opportunities to the architects of the day and soon the firm of Burling and Adler was counting its work "by the miles of frontage." The office was so busy that the young Adler was given an enormous amount of responsibility both as head draftsman and on the jobs which included many of the important local buildings of the day: the First National Bank, the Tribune Building, the Greenebaum Building, Delmonico's, the Oak Park Congregational Church, to name a few, and the residences of important Chicago citizens such as Ryerson, De Koven and others. This was Adler's first opportunity to meet the public, and he cast off his usual modesty to admit that Mr. Burling's clients "saw his confidence in me and respected me accordingly."

The year 1889 found Dankmar Adler in business for himself, a young man of considerable eminence in his field and married to the daughter of the president of his father's congregation. The most important commission on his drafting boards and the one that he considered the foundation of his professional career was the Central Music Hall which stood on the present site of Marshall Field & Co. A combination office building, series of stores and theater, it was unique in its day and the forerunner of the auditorium. The theater's marvelous acoustics established Adler as the leading acoustical engineer of his time. Even discounting his later successes, he considered the Central Music Hall his greatest achievement and it is quite fitting that a pillar saved from the building which was torn down shortly before his death now stands as a monument on his grave.

It was into a busy and successful office that Louis Henri Sullivan came that year (1879). He was fresh from two years at the Beaux Arts in Paris, with an air of self-confidence and pride, twenty-five years old and already known for his brilliance as a draftsman. Here was the kind of young man that Dankmar Adler needed on his staff and he must have recognized it at once for in two years time, with his characteristic sense of humor touched with a bit of sarcasm, he asked Louis, "How would you like to take me into partnership?" and the firm of Adler and Sullivan was born.

Dankmar Adler was ten years older than his partner, a settled family man with three children — two sons and the daughter who became my mother. The firm designed a house for the senior partner in the three-in-a-row style of the period. Sullivan was much at home there. He particularly enjoyed having dinner with the family on the Jewish Sabbath and often arrived armed with a gift: a piece of Tiffany glass, an exquisite tablecloth trimmed with Brussels lace — that I still have in my possession — or perhaps just a bouquet of flowers. Music was much a part of his upbringing and he used to play the piano for the children after dinner. The Adler children were not brought up in the Victorian tradition that "children should be seen and not heard" and conversations at the dinner table were lively and



Dankmar Adler as a young man

free. Their father had designed a "play room" for them in the basement of their house and each child had his own desk and locker — a private and inviolate domain.

Commissions continued to pour into the office. The clients remained Adler's for he had the qualities that inspire confidence. As Arthur Woltersdorf wrote in *The Western Architect* in July 1924: "No effort was too great or time devoted to a problem too much to tire Adler in his efforts to achieve the best results." But the most important building of their career and the high point in the history of the Chicago School of Architecture was the Auditorium building.

In 1885 Chicago had been host to an opera festival conceived by Ferdinand W. Peck, a man of great vision and intellect. The only suitable hall for such an undertaking was the huge barn-like Interstate Exposition Building in Grant Park on the site of the present Art Institute but how to make it into an attractive hall with seats for over 6,000 people and still provide adequate acoustics? Peck sought out Adler whose reputation as an acoustical wizard was by now common knowledge. A temporary structure of wood was planned within the building to contain a vast auditorium with balconies and boxes a completely equipped stage. The resultant acoustics were so perfect that as Sullivan said in his autobiography "the clear, untarnished tone of voice and instrument reached all." The opera festival was an enormous success and a year later Adler and Sulli-

van built a similar hall in the old Exposition Building in Milwaukee to house the Northamerican Saengerbund. This time the hall was made to seat 10,000 people and according to the *Inland Architect* the vast audience assembled could hear "not only choral and orchestral music but voices of soloists even in pianissimo passages."

So with these buildings as an example of their accomplishments Peck could do no better than to employ Adler and Sullivan as architects of the dream building which he had conceived.

Stockholders in the Chicago Auditorium read like a Who's Who of Chicago elite. This was a prestigious building, the largest commission in the country at the time. Originally estimated to cost \$2,000,000 it finally came to \$3,200,000, a colossal sum in those days. Sullivan's first renderings of the exterior were much more ornate and elaborate than the final plan which we know so well. This was due in part to the objections of some to Sullivan's type of decoration, and there is an anecdote that John Welburn Root declared that he didn't want another facade "smeared" with Sullivan's ornament, which remark piqued Sullivan into designing a severe exterior. More likely the influence of Richardson was at its height and although Adler deplored the omission of exterior ornament the simplified Romanesque plan prevailed. Frank Lloyd Wright vividly describes Adler and Sullivan's office where he was employed in those days. Dankmar Adler was the feared and respected chief, master of his craft, solidly dominating the whole building process. "His square grey beard and squarish head seemed square with the building and his personal solidity was a guarantee that out of all that confusion would issue the beauty of order. . . . The Chicago Auditorium was entirely Adler's commission and more largely Adler's own building than Sullivan's," he wrote in 1940.

In order to study opera houses throughout the world, Dankmar Adler traveled abroad the summer of 1888. His descriptions of his experiences there are full of warmth and humor and show his deep appreciation of the cultures of the countries that he visited. On the boat going to Europe he met Capt. William Jones, Carnegie's superintendent, and as a result of this friendship he was later called in as consultant on the acoustics of Carnegie Hall. My mother in taped interview claimed that her father would have been hired as architect of Carnegie Hall if a New York architect had not been called for. Dankmar Adler and Capt. Jones became close friends, both being inveterate deck pacers, and they later went together to meetings of the Iron and Steel Association in Glasgow. Even as we do today, they had some difficulty understanding the local dialect.

"We find that we don't speak the language of the country," Adler complained, "although at the Institute lunch the chairman of the meeting spoke as English as any American could."

London enchanted him and with an architect's eye he commented on "the immense numbers of parks and green squares all in the heart of the city" and "the comparative rarity of buildings more than five stories in height."

He visited Covent Garden and Drury Lane Theaters to study stage construction and examined numerous other theaters "in various stages of erection." The fame of the Auditorium had spread to England and he was asked for press interviews. The art galleries of Brussels, its elegant Hotel de Ville, the Flemish Gothic cathedral — all fascinated him.

"I must confess," he wrote, "that I like an exhibition of the works of modern painters better than the works of old masters, and the stiff, naive, literal and somewhat grotesque work of the VERY old masters better than that of the so-called masters."

We know that he visited the Vienna Opera House, but his letter from there was written to his wife in a mood of homesickness when all he longed for "was a nice quiet old-fashioned time with my own darling dear old girl."

Paris, a few days later, found him in a happier and more loquacious mood. He had traveled there on the crack "Orient Express" from Vienna. Trains had always fascinated him and he describes in detail the luxurious accommodations and the charming scenery.

In a letter dated 9-24-88 he wrote "the landscape in the immediate foreground looked very soft and vividly green, the mist then hid the middle distance while occasionally the higher hill tops, sometimes tree-covered, sometimes rugged and rocky and then again capped by an old town or castle, stood out above the mist and made altogether a most enjoyable series of pictures."

The scenery did not provide the only diversion on his trip. He was apparently an excellent mixer, enjoying the company of an assortment of traveling companions. One in particular, a wealthy bachelor from California, he describes as a walking encyclopedia of useful information for travelers — "a poly poly polyglot and an 'immature amateur' performer on every queer musical instrument! He enlivened the time for us by playing on the mandolin, the guitar and the castenets and by singing songs, serious and comic, in every conceivable language" to the amazement of the other passengers. "All of France that we saw was lovely," he goes on to say, "broad valleys between ranges of hills of gentle slope, all under perfect cultivation — villages never out of sight of the train or of each other, the houses generally white with tiled roofs — each village with its square-towered church — innumerable flower gardens — so there was almost continually wafted through the open windows the most lovely perfume."

Although we have no records of the rest of Dankmar Adler's trip abroad, we know that he visited the opera houses of Halle, Prague and Budapest and that he later employed many devices used in these theaters in the remarkable stage apparatus of the Auditorium although the plans had to be redrawn to conform to American standards.

The cornerstone of the Auditorium had been laid with much fanfare in 1887 by President Grover Cleveland. Then in 1888 the Republican Convention was held in the partially completed hall. Finally the grand opening took place in December 1889 and President Harrison who had been nominated there returned

for the dedication, which was one of the most glittering in history. When the program, which included songs by Adelina Patti, America's idol, and addresses by many dignitaries, came to its conclusion there were shouts for the architects to take a bow. My mother used to tell that her father could not be found. He was in the basement tinkering with the boilers, probably more through modesty than necessity.

Ferdinand Peck was ever aware of Adler's part in the construction of the Auditorium. He wrote to him in June 1888: "During the pressure upon me this week I have overlooked saying what I now desire to state in a few words. While you doubtless have received many congratulations as well as myself arising from the success of our Hall, yet I must personally send you this tribute of my personal recognition of your genius and services in the designing and construction of the Auditorium together with the special details involved in the preparing of the Convention Hall. There is but one opinion in the minds of the American public on this subject, as evidenced by the articles written by outside correspondents as well as for our local press. Your part in the achievement will never be forgotten by me.

Very truly yours,
Ferd. W. Peck

"I enclose herein an order for a hat resulting from our discussion about the Wabash Ave. entrances and stairways. You have more than fairly won it."

After the great success of the Auditorium the firm was busier than ever. Their work took them farther afield: to Pueblo, Colorado, to build an opera house, to Salt Lake City for the Dooley Block, to St. Louis for the famous Wainwright Building and to Buffalo for the Guarantee Building. At home they built the McVickers and Schiller Theaters and the old Stock Exchange Building and numerous houses, churches and temples.

One of the main reasons for the choice of Chicago for the Columbian Exposition of 1893 was its great architecture. No other city could boast of a theater to equal the Auditorium or of the outstanding modern office buildings of Burnham and Root and Adler and Sullivan. The parks and the lake front were the most beautiful in America. The center of culture seemed to be moving from Boston to the Middle West. So it was all the more ironical that the Fair itself turned from the innovations and triumphs of the Chicago School of Architecture and imitated the Greek Classical, to create a dazzling but decadent White City.

Six Chicago firms, in addition to those from the East, were represented at the Fair and the largest commission went to Adler and Sullivan who alone revolted against the classical theme to build their famous Transportation Building with its ornate and colorful golden door. Although the facade of the building was Sullivan's, the shed which housed the building's displays was undoubtedly Adler's design. He loved trains, as we saw in his letters, and he must have enjoyed creating the elaborate and handsome building that held the latest in Pullman cars and locomotives. In recognition of his contribution he received a medal from the exposition which bears an Art Nouveau design on its face

of a plump and lovely nude lady riding on what appears to be a railroad handcar. She leans against a cornucopia and holds a giant feather aloft as the sun rises in the distance on the numerals 1892. On the front is an inscription: "To Dankmar Adler, one of the designers of the World's Columbian Exposition." The World's Fair had no sooner ended, its buildings to be abandoned and demolished, than a depression hit the country. The building boom was over and Dankmar Adler found himself with three children to educate and very little income. So it was impossible for him to resist the offer of his friend, Richard T. Crane, to join his Elevator Company as consulting architect and general salesman, at a salary of \$25,000 which was greater than he had made in any one year in his profession. But almost at once he found that an office job under the control of a strong-willed and successful man like Crane was not for his independent spirit. So six months later he returned to the practice of architecture, however without Sullivan.

There have been many conjectures as to why the partnership was not resumed and one can only guess as to the reasons. The logical explanation seems to be that Abe Adler, his son, had recently graduated from the University of Michigan and, as would be only natural, father and son opened an office together. By now Dankmar Adler was very active in the AIA and was elected second president of the Western Association of Architects. He wrote extensively, and hardly an issue of the *Inland Architect* went to press without an article or a statement by him. He was instrumental in drafting a state law for the recognition and legal control of the architectural profession. He traveled to New York and Boston to address meetings there and, he wrote his wife, "It feels good to be treated as a man of distinction and I want to take it all in while it lasts."

His work during this period included several factories and warehouses and a group of buildings for the Morgan Park Military Academy.

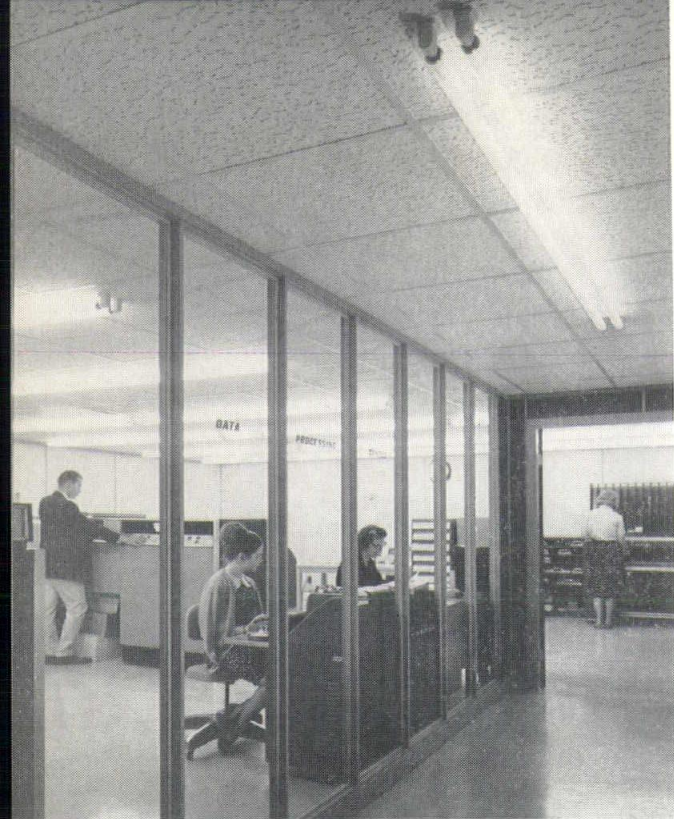
His home life continued to delight him, especially my mother's marriage in 1897 and the birth two years later of the elder of my two brothers. The last letter which his wife wrote to him from a trip reminded him to go to visit his mother often. "Life is so short, my dearie," she wrote, "and your mother is so happy when you come to her."

Life was indeed short for Dankmar Adler. He died in April 1900 at the age of 56. The heritage which he left through his architectural innovations and his contribution in the furthering of the ethical standards of his profession through the legislation which he advanced and the articles that he wrote we will consider in future editions of this magazine.



Adler in 1898

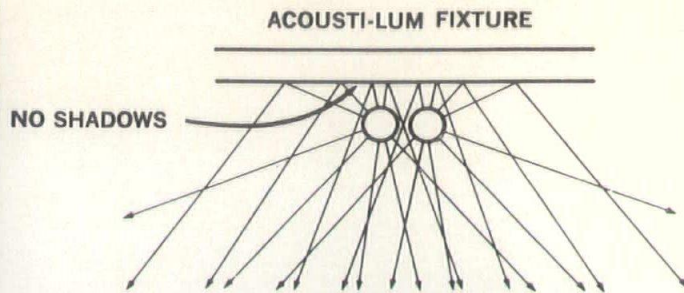
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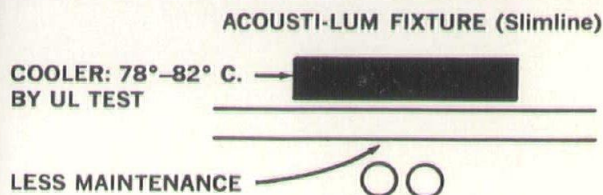
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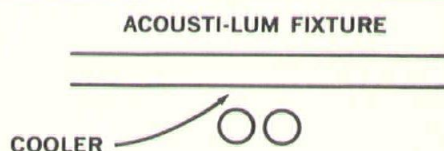
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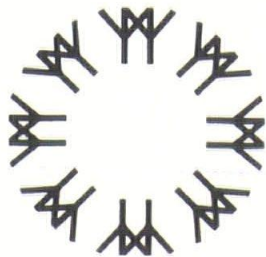


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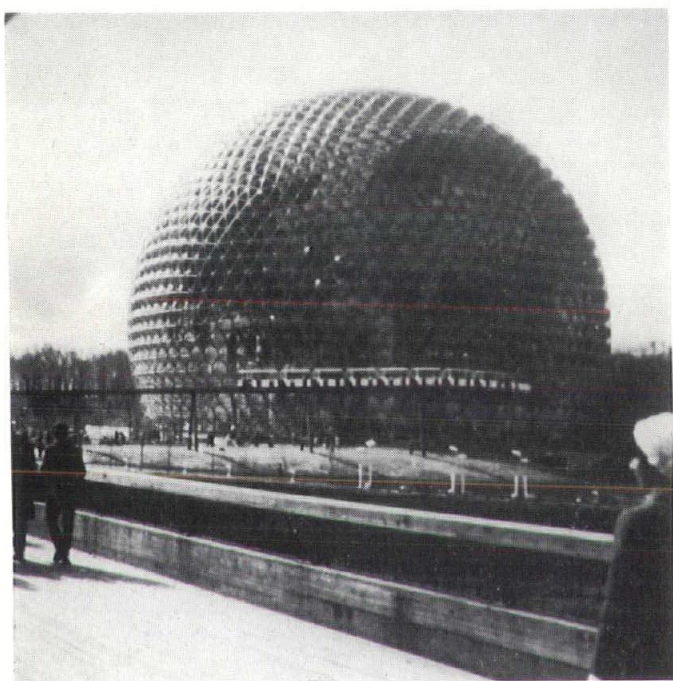
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expo67



*Reimar F. Frank, A.I.A.
Milwaukee, June 1967*



Four years ago the City of Montreal announced that an International Exposition would be staged on two islands opposite the City in the Saint Lawrence River. Then, only a part of one island existed. Today the existing Ile Sainte Helene has been doubled in size and a new island, Ile Notre-Dame has been created. On both of these islands and a portion of Montreal's riverfront, known as Cite du Havre, the exposition, Expo '67, has emerged as a tribute and the commemoration of the Dominion of Canada's first century as a federated nation.

"Man and His World" is the theme of Expo '67 and is expressed by a series of Theme Pavilions promoted by the Expo authorities. The group of nations sponsoring the international pavilions were encouraged to adopt the Expo Theme for their exhibits, and this was followed with varying degrees of success. The Expo planners ruled that all international and theme pavil-

ions be of a noncommercial character and that any sales of goods would be conducted in separate international "boutiques" gathered in several groupings near the respective nation's pavilion.

To see Expo '67 is an extraordinary experience; it is larger and of greater scope than any international exposition ever to precede it. The Canadians have accomplished the massive task of assembling Expo in three short years and have delivered to the world the finest array of exhibits and structures ever to be seen in any international exposition.

Expo '67 consists of four separate areas, the Cite du Havre, which includes the principal entrance to Expo and the magnificent Habitat apartment complex; Ile Sainte Helene and Ile Notre Dame where the international and theme pavilions are located.

The amusement and entertainment facilities are all situated at La Ronde, a land-filled addition to Ile Sainte Helene.

The entire Expo complex is served by a very efficient electronically controlled transportation system. Montreal has built a new subway, The Metro, system which primarily serves the city of Montreal; but it also travels from downtown directly to a terminal at Expo on Ile Notre Dame. The backbone of Expo transportation is the free fare Expo Express which shuttles frequently from the fair entrance at Cite du Havre to the terminus at La Ronde, with stops in-between. Complementing the Expo Express is a network of automated Minirail trains which weave in and about the pavilions affording the fair-goer an unparalleled tour of the Expo grounds. The entire transportation system is well planned, very convenient, and handles all but the largest crowds with ease. Speaking of the crowds, Expo has computers which are programmed to project the daily attendance, and to date the Expo populations have exceeded the computer's predictions by at least 25%. In May, on a cold, rainy day 110,000 persons were expected; over 140,000 showed up!

The architecture of the pavilions and exhibits at Expo is generally excellent. The planners of Expo were determined to encourage the participants to produce outstanding design for their buildings and pro-

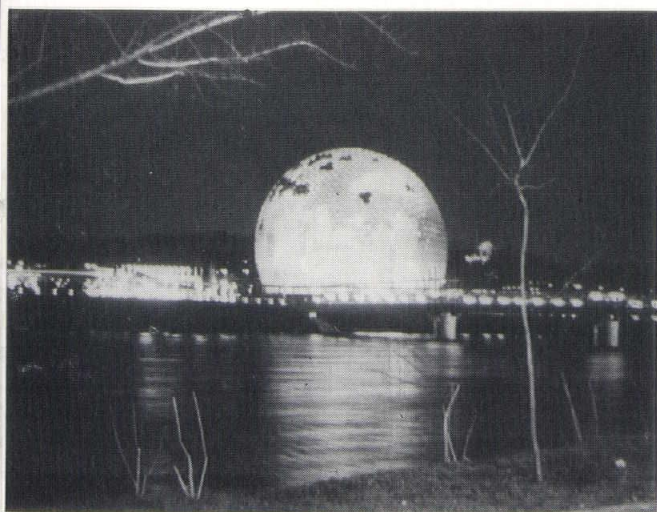
vided them with a developed site which itself is masterpiece of design. The architecture is varied, ingenious, experimental, frivolous; and only occasionally ordinary. Expo offers the architect a rare opportunity to exploit the limits of his creative ability.

Without a doubt the most outstanding work of architecture at Expo is the fantastic apartment building, Habitat 67. Historians will record Habitat 67 as a major contribution to the development of architectural design and engineering, and its significance will match the Crystal Palace at the 1851 London Exposition, and the Eiffel Tower at the 1889 World Exhibition in Paris.

Designed by Israeli-born architect, Moshe Safdie, Habitat 67 is an amazing series of stacked concrete boxes, arranged in a terraced geometry with the roof of one living unit providing an outside space for another. 354 precast concrete shells are interconnected with post-tensioned steel cables to form 158 housing units with 15 different floor plans. This unique method of construction allows the concrete boxes to be assembled into practically any imagined arrangement. While Habitat '67 was initially very expensive to construct, its revolutionary technique shall perhaps become the exist throughout the exhibit areas.

In both design and use of new materials the pavilion of West Germany is a notable accomplishment. Basically the structure is a tent with a plastic skin which is attached to a network of steel cables, supported by a series of eight tubular steel masts. The plastic skin is translucent and permits a pleasant glow of daylight to exist throughout the exhibit areas.

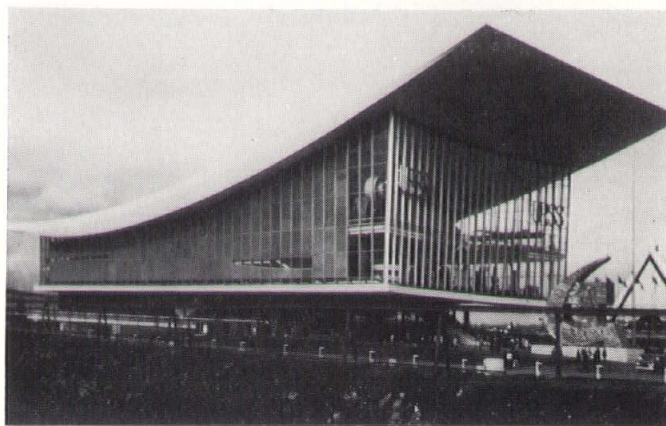
While the pavilion of West Germany's received the unofficial grand award in design at Expo, the United States Pavilion is the delight of the fair. As Ed Stone did with the U. S. Pavilion in Brussels in 1958, Bucky Fuller has created a magnificent 20-story high geodesic sphere which captures the spirit of Expo with finesse.



The U. S. Pavilion is situated by itself across a channel of the St. Lawrence River on Ile St. Helene and poses like a jewel before a wooded hillside in the background. This setting, with a flag court in the front, is the finest at Expo.

The interior of the spherical structure includes a series of levels or platforms which are linked by a sys-

tem of escalators. The pedestrian traffic movement, even with crowds, is not too congested. The exhibit areas are located on these various levels and are located throughout the space of the sphere. The vertical separation of these platforms allows the crowds of fairgoers to comfortably see all of the exhibits. If there is any criticism of the United States entry at Expo, it is with some of the exhibit material itself. There is an overabundance of pop-art displayed, and there is too much emphasis placed on the American film industry. Otherwise, the balance of the American presentation is well-done, imaginative, and interesting, particularly the display of space achievements and space equipment.



Competing with the United States Pavilion is the popular Pavilion of the Soviet Union. Located on the opposite end of the Cosmos Walk, a pedestrian bridge linking Ile Sainte Helene and Ile Notre Dame, the Soviet Pavilion contains a massive display of industrial and space material. The building, designed by an Italian architect, is far better than its Brussels predecessor, but its overpowering scale and bulkiness does not contribute to the otherwise excellent design of the fair.

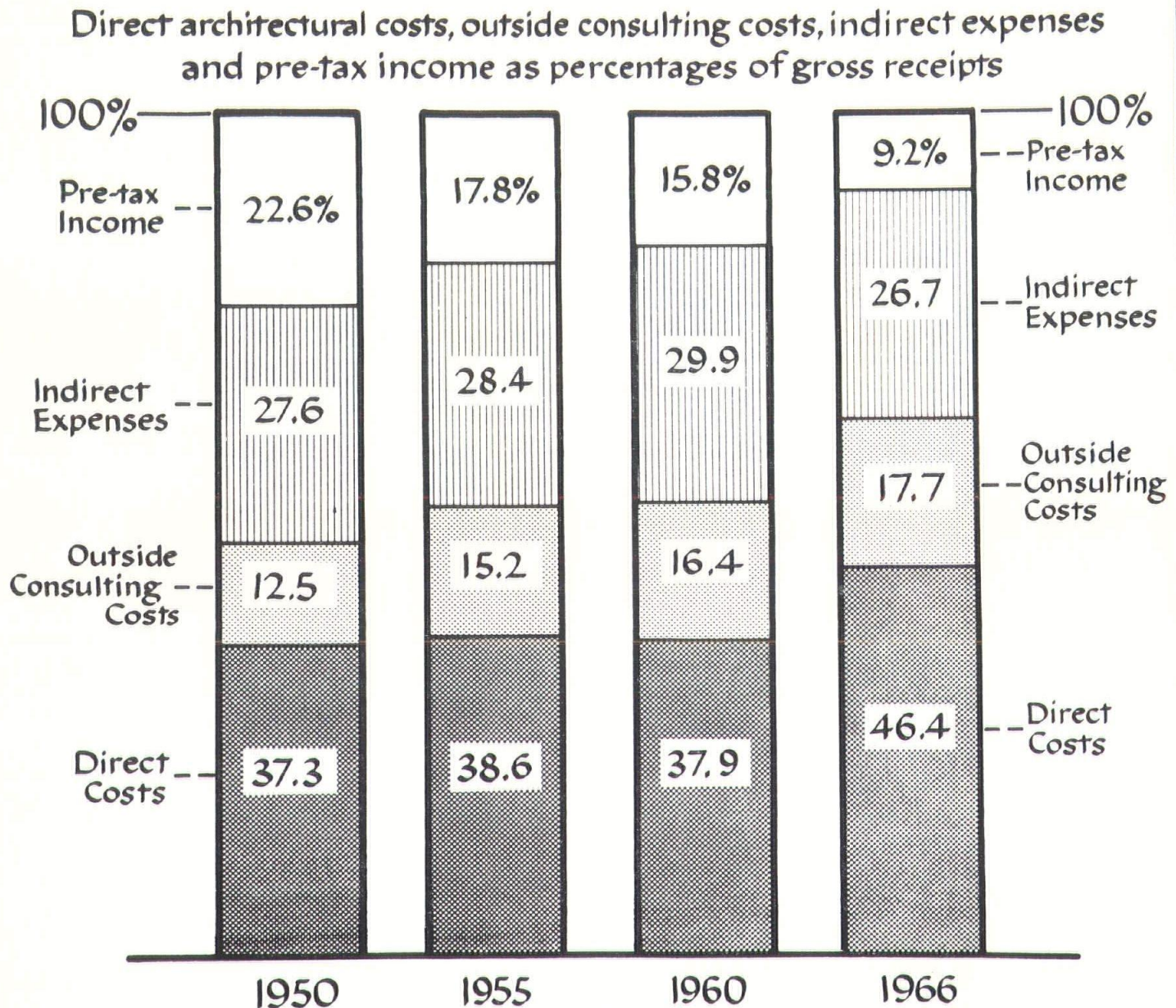
Other Communist countries have fared far better with the design of their pavilions, most notably those of Yugoslavia, Czechoslovakia, and even Cuba.

The international pavilions of Israel, Greece, Australia, Italy, Switzerland, and African Community complex have all added delight to Expo. The Canadian section is very well executed with special recognition for the design of the Ontario Pavilion. As the host country, Canada has many exhibits, both those of the provinces and those of the Canadian Trades and Industries. The overall excellence of the entire Canadian effort cannot be overlooked.

Visiting Expo '67 is quite simple: all one needs is a confirmed hotel reservations and a \$2.50 "passport" for general admission. Once inside Expo touring the exhibits and pavilions is admission free. The international restaurants, however, are not, and can be quite expensive. Hotel and motel space in Montreal will be in high demand this summer and the rates are also high. But Expo '67 at Montreal, Canada, is a very worthwhile experience, and until Expo '70 opens in Japan, Expo '67 offers the world the most complete and best conceived world exposition man and his world has seen.

COST AND INCOME TRENDS IN ARCHITECTURAL PRACTICE FOR THE YEARS 1950, 1955, 1960 & 1966

(Data from Financial Statements)



A management consulting firm conducting a study of the cost of architectural services reported that (1) the cost of such services has gone up sharply, (2) the profits of architectural firms have dropped sharply, and (3) clients of architectural firms are demanding "much more complicated and sophisticated service."

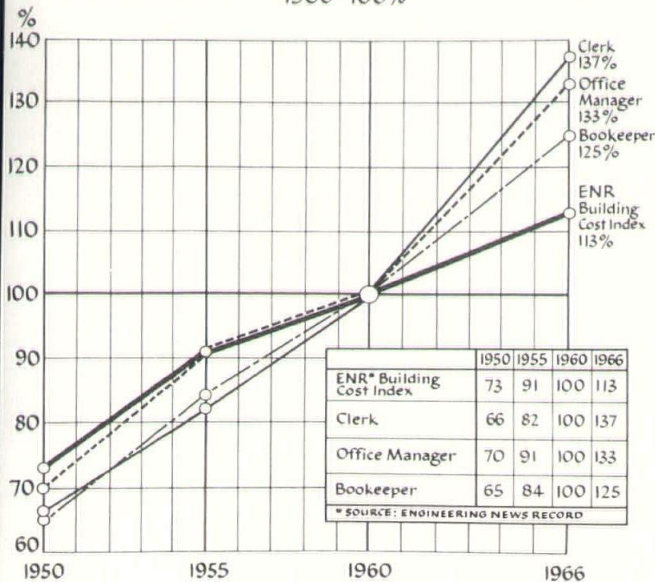
The preliminary findings of the study were presented and discussed at the annual convention of The American Institute of Architects, which was attended by about 4,000 architects and guests. The study, entitled

"Comprehensive Study of the Cost of Architectural Services," is being performed by Case & Company for the AIA.

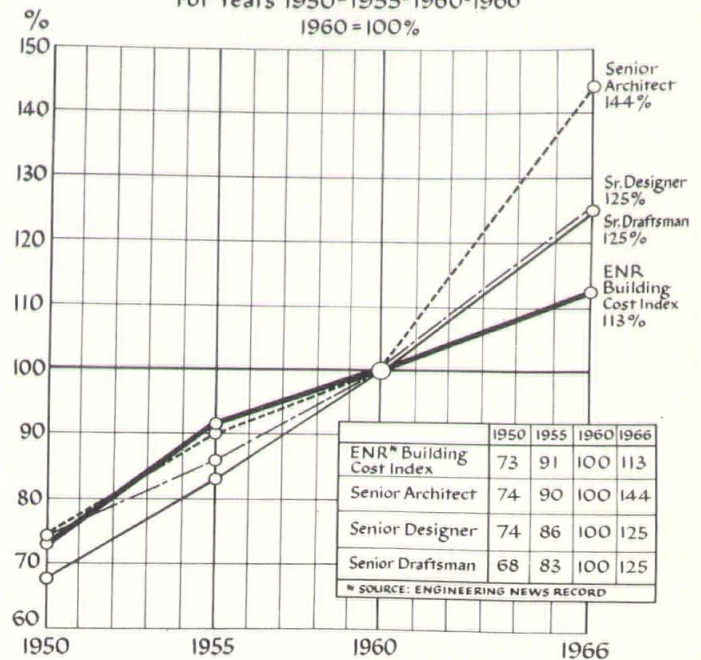
Case & Company said that further details would be available later. The study involved collecting and analyzing confidential cost and profit information from 223 architectural firms in 47 states, as well as cost and profit details for 1,150 projects recently completed by these firms.

Preliminary Report on Cost of Architectural Services Study

**COST OF INDIRECT SERVICES
COMPARED WITH BUILDING COSTS**
For Years 1950-1955-1960-1966
1960=100%



**COST OF DIRECT PROFESSIONAL SERVICES
COMPARED WITH BUILDING COSTS**
For Years 1950-1955-1960-1966
1960=100%



The preliminary findings included the following:

1. There was a sharp increase in the direct costs of performing architectural services from 1960 to 1966, and there was a steady rise in the cost of outside consulting services from 1950 until 1966. Overhead has been maintained at a relatively stable level despite significant increases in the pay scales of employees in the architect's office.

2. The pretax income or profit of the average architectural firm has declined from 22.6 percent of total gross receipts in 1950, to 17.8 percent in 1955, to 15.8 percent in 1960, to 9.2 percent in 1966.

3. Last year, one architectural firm out of 12 suffered a loss for the year's work — a loss averaging about five percent of annual gross income. And on the average, architects are currently losing money on one project out of four.

4. Despite recognized disadvantages involved in using construction cost as the basis for compensating architects for professional services, this method was used in 84 percent of the projects analyzed.

5. By comparing the *Engineering News-Record* building cost index with pay rates for direct and indirect services of architectural firm employees, it was found that the building cost index has risen 13 percent since 1960, but pay rates have gone up 25-44 percent. Case & Company called this an "excellent example of the price-cost squeeze which is plaguing the architect."

6. Nine out of 10 architects say their clients now demand much more complicated and sophisticated service than they did 10 years ago. These demands include increased risks, increased liability, increased programming, and increased engineering.

Today's architects thus face a serious dilemma and are asking such questions as:

How can I provide clients with attractive, functional and sound buildings within their budget limitations? How can I maintain a high quality of design in spite of constantly rising costs for services and materials? How can I manage my practice so that my monetary return is proportionate to my investment of time, money and effort — plus the value to my client of my skill and knowledge?

It was noted that there are no quick or easy answers to these questions, but it said that the survey has identified areas where there is a need for remedial measures. These areas are:

1. Overcoming the pressures of the profit squeeze — budgeting job time, controlling costs and expenses, pricing services, and using technical manpower effectively.

2. Determining better and more equitable methods of compensation for architectural services.

3. Deciding to what extent architects should provide some or all of the services for which they now engage outside consulting services.

4. Planning "profit" into architectural practice — into each project and every year's operations.

5. Educating clients and the public in what architects do, how they do it, and how they earn their fees.

6. Devising an "information bank" where architects can quickly obtain up-to-date facts, figures and trends pertinent to "running the office," such as costs, policies, employee benefits, methods and techniques.

The Modern Water Softener

by RAY STICKLER, *vice president*, Stickler & Downs, Inc.

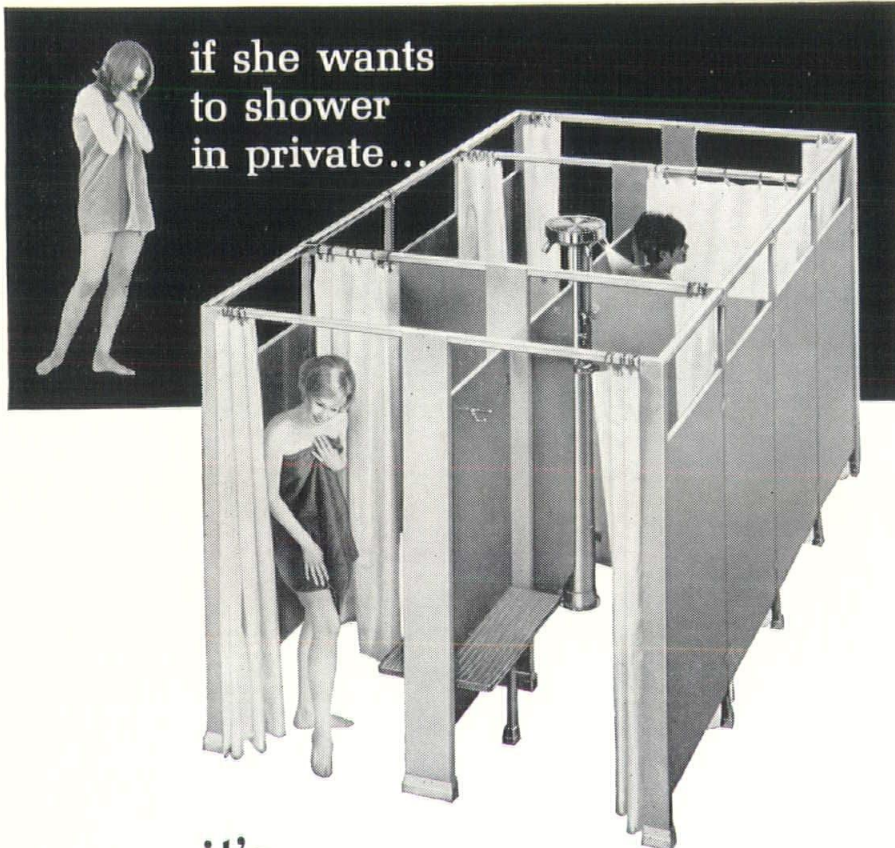
Before getting into the mechanics of the modern water softener, we need to have an understanding of the basic water problems. There are four elements with which we will be concerned in this discussion. The first is water, which in this instance is rain water. The rain water passing through the clouds to the earth will dissolve some of the gases

in the air. The most common of these gases being carbon dioxide which when combined with the water leaves it slightly acid. The slightly acid water comes in contact with the earth and dissolves alkaline substances such as limestone, a compound known as calcium bicarbonate, which when heated reverts back to the original

elements. Heat applied to water in use causes dissolved limestone to drop out of solution as scale and at the same time, it releases carbon dioxide. The bicarbonates are referred to as temporary hardness since heat will cause them to break down. The limestone will deposit on any material which is transferring the heat to the water. These could be cooking utensils, water heaters and boilers. The calcium carbonate limestone being relatively insoluble will combine with chemicals added to the water and will reduce the efficiency of these chemicals. These elements are measured by grains per gallon. Water having more than 3 GPG is considered troublesome and should be treated.

Since the more common problem causing elements are calcium, magnesium and iron, the most common water treatment method is water softening. Because these elements are dissolved in the water, they form electrically charged particles called ions. Calcium carbonate which is limestone, for example, forms a calcium ion with + (plus) charges and a carbonate ion with - (negative) charges. The ions with + (plus) charges are called cations and they are the ones which we are specifically concerned with today. Certain natural and synthetic materials have the ability to remove mineral ions from water in exchange for others. This is the basis of the modern water softener.

The modern water softener consists of a vessel called the mineral tank which holds the ion exchange material. The softener uses a synthetic ion exchange material more commonly referred to as sodium zeolite resin. This material very basically is a sulfonated styrene plastic material which is an inert material and will not dissolve in water. It is also unaffected by most chemicals and is therefore referred to as a "lifetime resin." This is a cation exchange resin and will react only with the positively charged ions such as calcium, magnesium and iron. The raw water is passed through the ion exchange resin bed and then into the service lines.



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The exchange of ions takes place as the water passes through the resin bed. Each resin bead is coated with sodium ions which will be exchanged for the calcium, magnesium and iron ions. The water passes through and around each resin bead and the calcium and magnesium ions have attached themselves to the resin bead and have in turn displaced sodium ions. Sodium is not a scale forming element; therefore its presence in the water goes relatively unnoticed. The exchange resin has a limited capacity for these ions and will eventually reach an exhausted state. The number of sodium ions has depleted to almost nothing; therefore the exchange can no longer take place. The exchange capacity of the ion exchange resin is a function of the amount of sodium used in the regeneration process. In the exhausted state, the resin beads are saturated with calcium and magnesium ions and the next step is to displace these hardness ions with sodium ions to ready the resin bed for another service cycle. The regeneration cycle is the reverse of the initial ion exchange. We are introducing into the resin bed a concentration of sodium ions which will then displace the calcium and magnesium ions, place them into solution and the sodium ions will again deposit on each individual resin bead. The calcium and magnesium ions which have been placed back into solution are rinsed to the drain in the regeneration cycle. The cheapest source of sodium and the easiest to handle is ordinary salt. We dissolve sodium chloride which is ordinary table salt into a brine solution which is passed into the ion exchange resin bed during the regeneration cycle.

We have now gone through the four basic cycles of operation of a water softener. These cycles are controlled by a control system consisting first of a main control valve. The control valve simply directs the water in the proper direction for each particular phase of operation. The main control valve is in itself controlled by a timing mechanism which will allow it to change the flow of water and to remain in that condition for the required length of time. The timer mechanism will

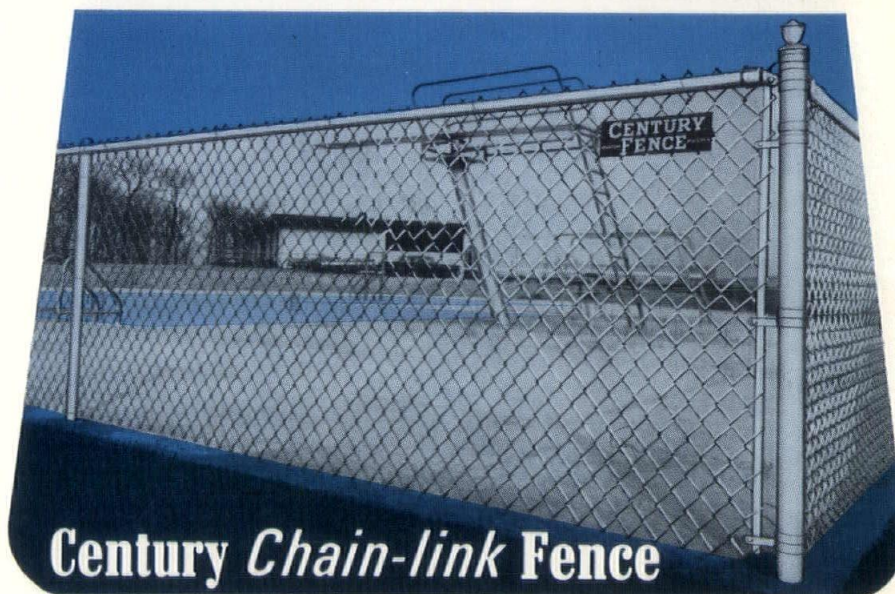
then reposition the main control valve for the next operation.

There are many boiler water treatment chemicals available which when properly applied will minimize scaling and corrosion. However, these chemicals are expensive and the feed of these chemicals must be accurately controlled. Soft water, on the other hand, will eliminate the scaling problem since

sodium compounds do not deposit. Soft water also reduces the amount of internal chemical treatment required. This chemical treatment will still be required because of dissolved oxygen and alkalinity problems. The use of soft water reduces the amount of chemical treatment required since it allows the chemicals to operate more efficiently.

(Continued on page 38)

keeps the "drop-ins" out



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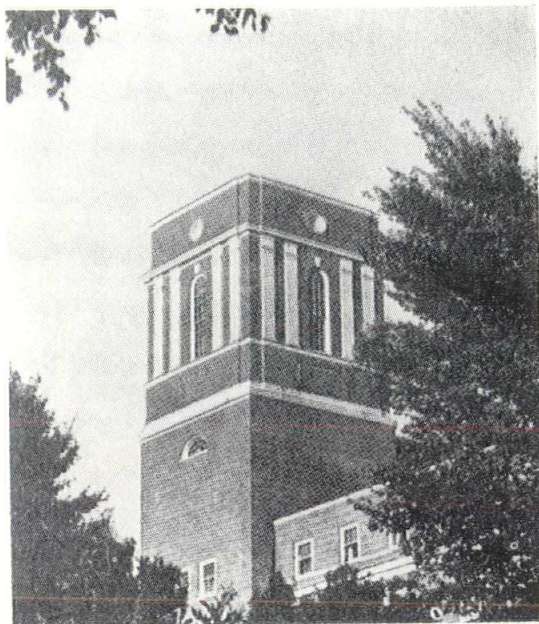
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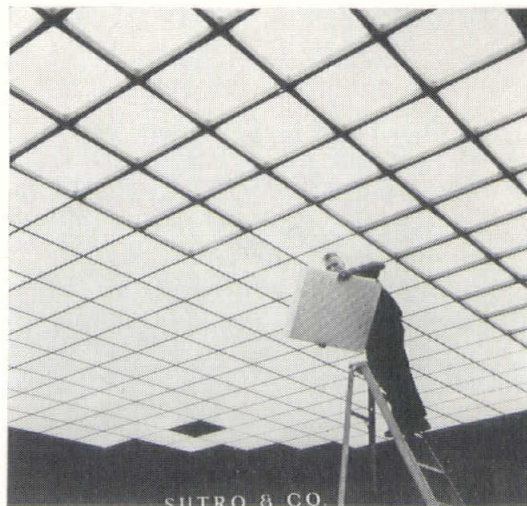


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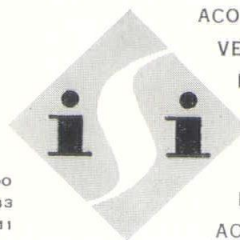
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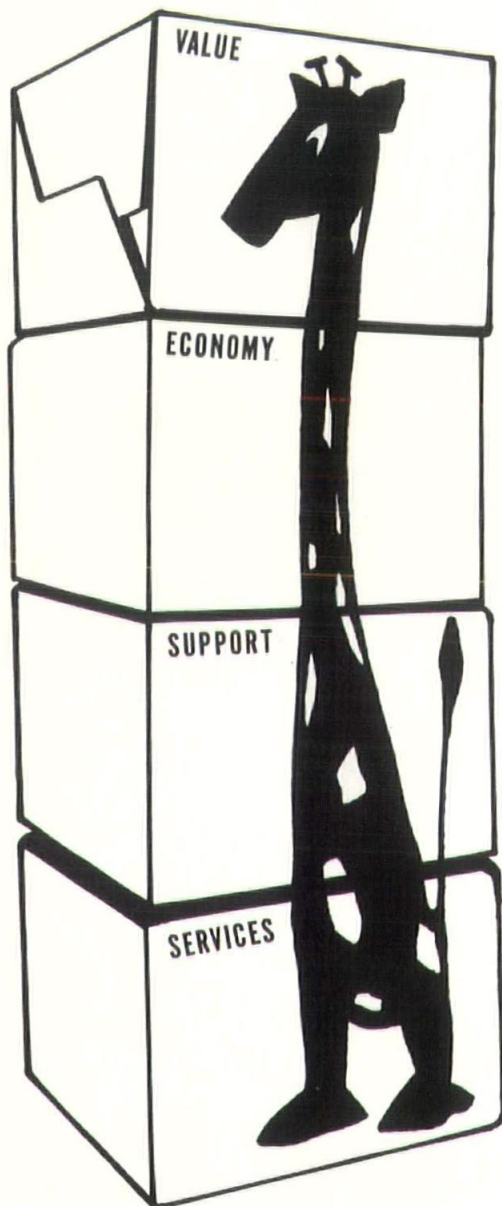
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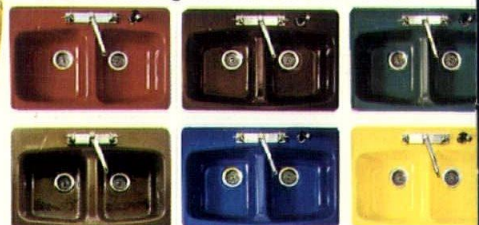
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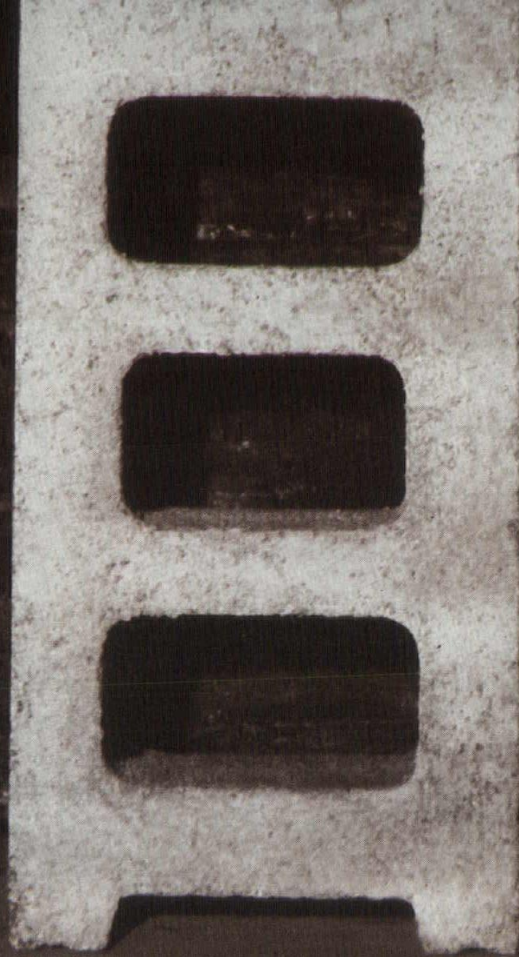
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the Bold Look for '67/Kohler Co., Kohler, Wisconsin

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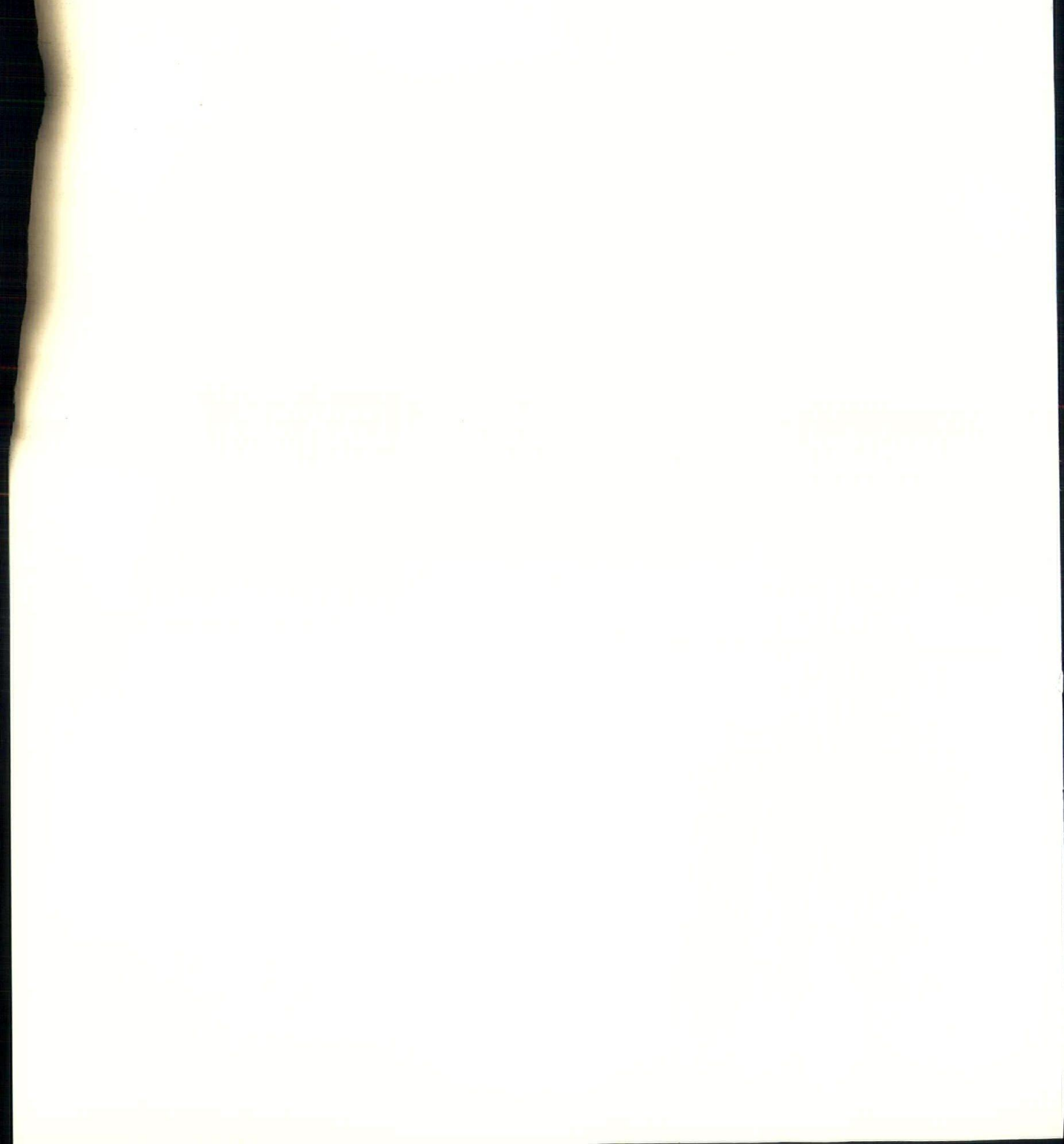
In addition to its outstanding resistance to fire, USS GARYLITE expanded slag aggregate is light in weight (some aggregates weigh over 50% more), durable (wetting, drying, and freezing have little or no effect), economical (it costs less

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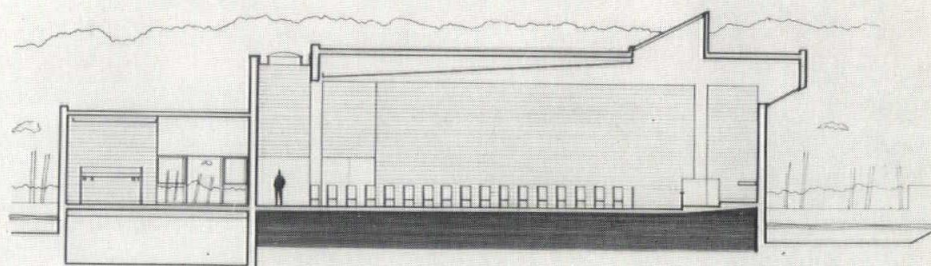
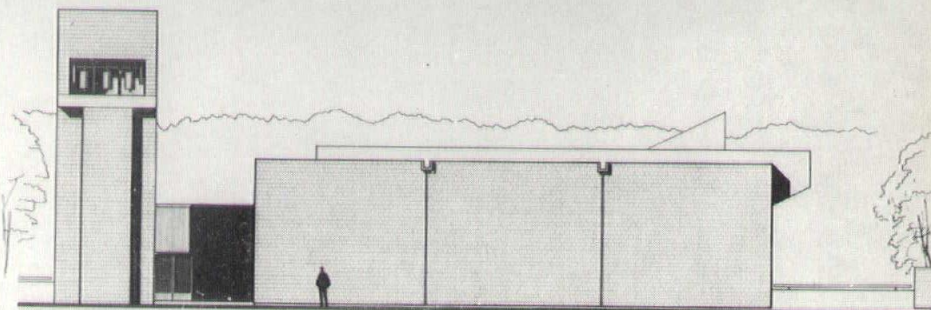
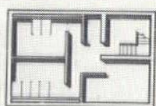
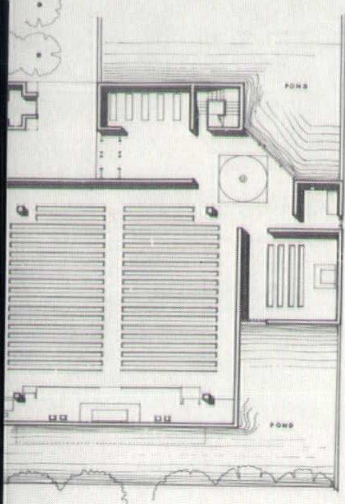
Next time you need lightweight concrete, check into the advantages of specifying USS GARYLITE expanded slag as the aggregate. For more information and a copy of our free booklet, write United States Steel, Slag Products Section, Room 4523, 208 South LaSalle Street, Chicago, Illinois 60690, Area Code (312) 236-9200. USS and GARYLITE are registered trademarks.



Garylite Slag



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ARCHITECTURAL GRADUATE

Robert D. Cooper of Greendale, Wisconsin, graduated from Carnegie Institute of Technology, Pittsburgh, Pennsylvania, in June, standing first in his class of 27 students with a grade point average of 3.5/4.0. He was honored by receiving the A.I.A. Student Gold Medal and a \$1,500 Fellowship for a year's study at the University of Pennsylvania for a Master's Degree under Architect Louis Kahn.

Mr. Cooper's thesis on Fraternity Housing worked up a remodeling program for existing buildings at Carnegie Tech with additions and new buildings in a well-conceived complex.

Shown here is one of Mr. Cooper's design problems, the John Stewardson Memorial Award Competition. Such competitive work is a regular part of the department's assignment, a practice also engaged in at other architectural schools. This was a 10-day sketch problem in ink and/or pencil on two 20"x30" boards, the project being the design of a Lutheran Seminary and

Chapel for an eastern Pennsylvania city in competition with students of Penn State and the University of Pennsylvania. Mr. Cooper was selected as one of the six finalists.

Miller and Waltz, Milwaukee architects, will provide employment for Mr. Cooper this summer as they have in the past. After he receives his Master's, he faces possible military service. Eventually he hopes to return to Wisconsin to practice.

He and his father, William Cooper, Jr., have been most appreciative of the Tuition Grants for 1965-66 and 1966-67 provided by Wisconsin Architects Foundation. The student received fine recommendation from Professor Robert H. Burdett, assistant head of the Department of Architecture at Carnegie — "An outstanding student with high professional promise deserving of support."

The work of two other 1967 graduates will be published in future issues.



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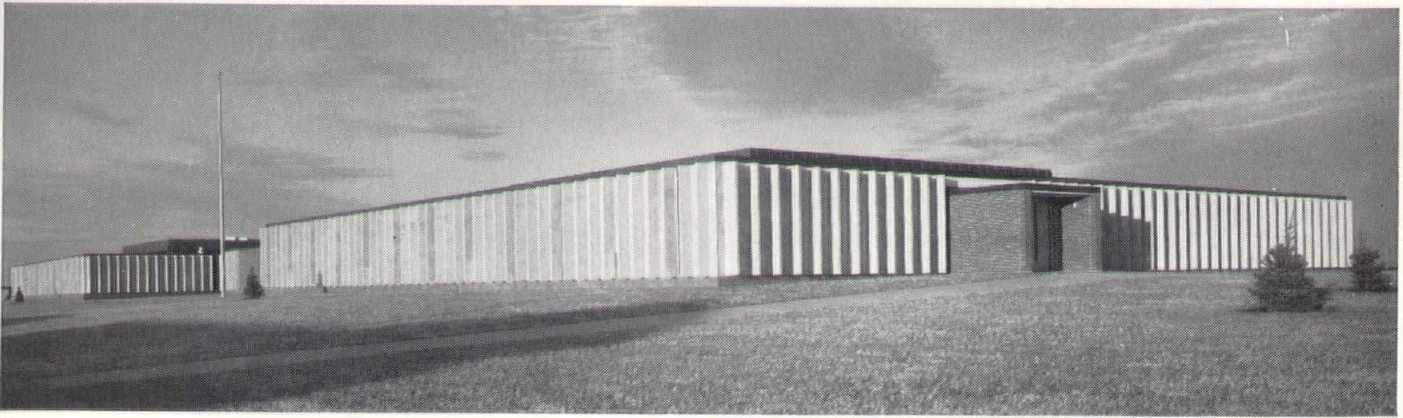
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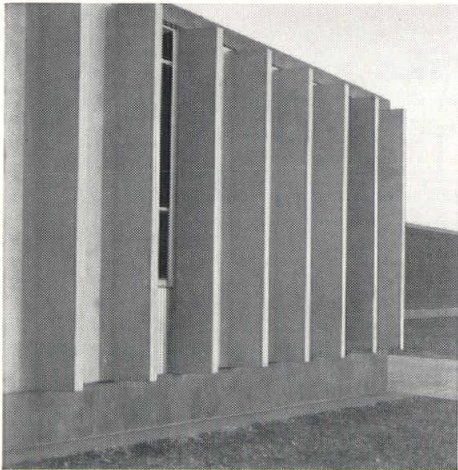
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Simplified way to build a concrete school

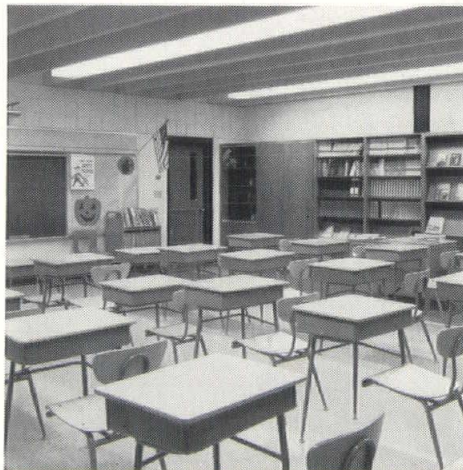
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Architect-Engineer: Foss, Engelstad & Foss, Moorhead. General Contractor: T. F. Powers Construction Co., Fargo, N.D. Precast, Prestressed Concrete Fabricator: Wells Concrete Products Co., Wells, Minn.



Close up of precast wall panels



Classroom with ceiling of exposed double-tees and concrete masonry walls

The Probstfield Elementary School in Moorhead, Minnesota, represents a simplified system of construction rapidly gaining favor for its speed and economy. Both roof and walls are double-tee units of precast, prestressed concrete.

The double-tee roof integrates decking and beams to create its own ceiling. The three-sided recesses formed by the "tees" simplify lighting and air duct installation.

Double-tee curtain walls, using load-bearing concrete masonry as backup, provide a striking and height-accenting

exterior. Easily repositioned, they facilitate future expansion.

The school consists of 21 classrooms, a multi-purpose room, gymnasium, shower and locker rooms, kitchen and office area. The cost—\$14.90 per sq. ft.—included all electrical and mechanical work, as well as kitchen, cafeteria, science and gymnasium equipment. Complete sitework—parking lot, sodding and extensive landscaping—was also included.

Moorhead school officials found concrete met their many requirements, including fire safety and long-term economy.

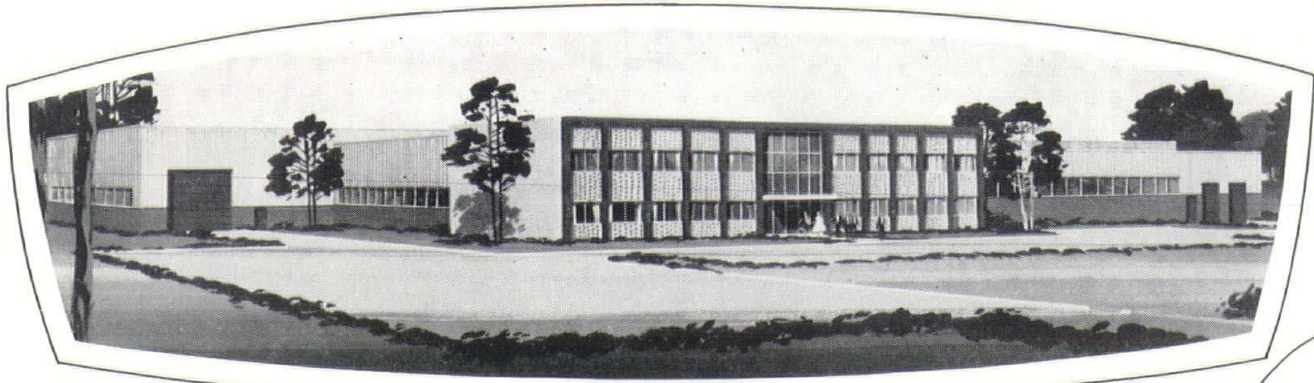
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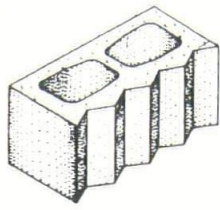
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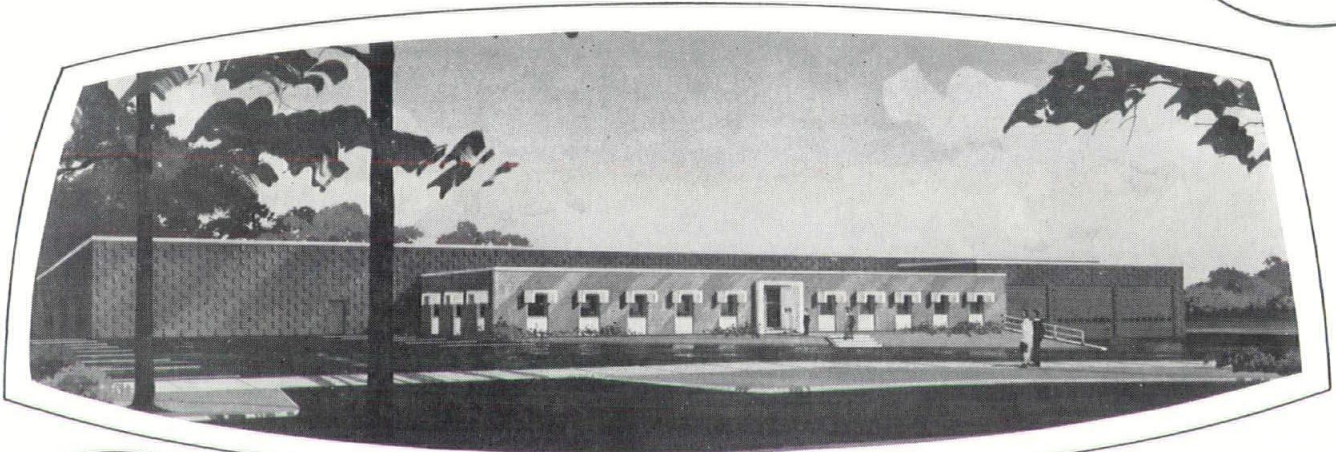
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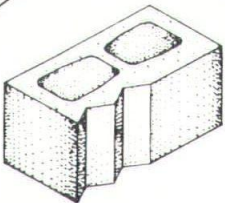
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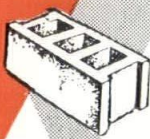
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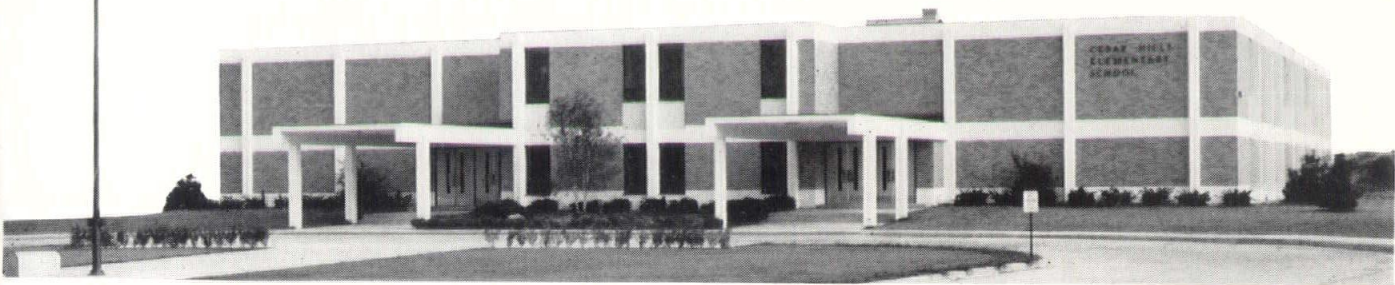
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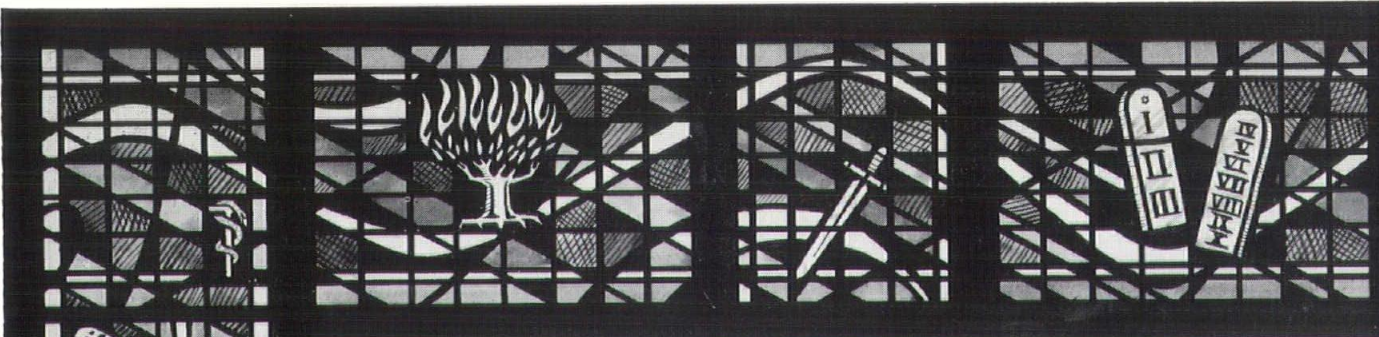
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(Continued from page 27)

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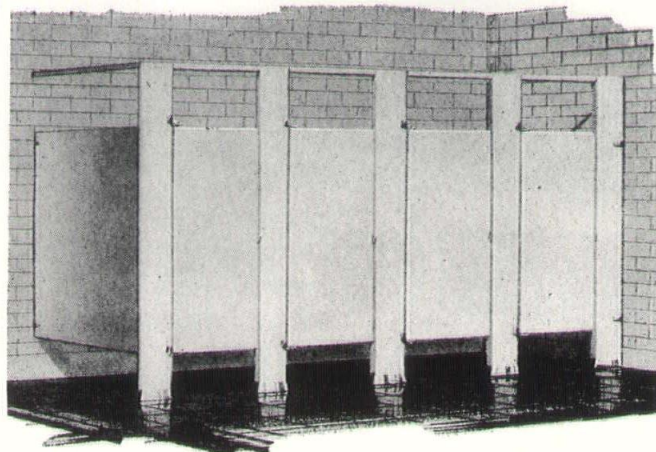


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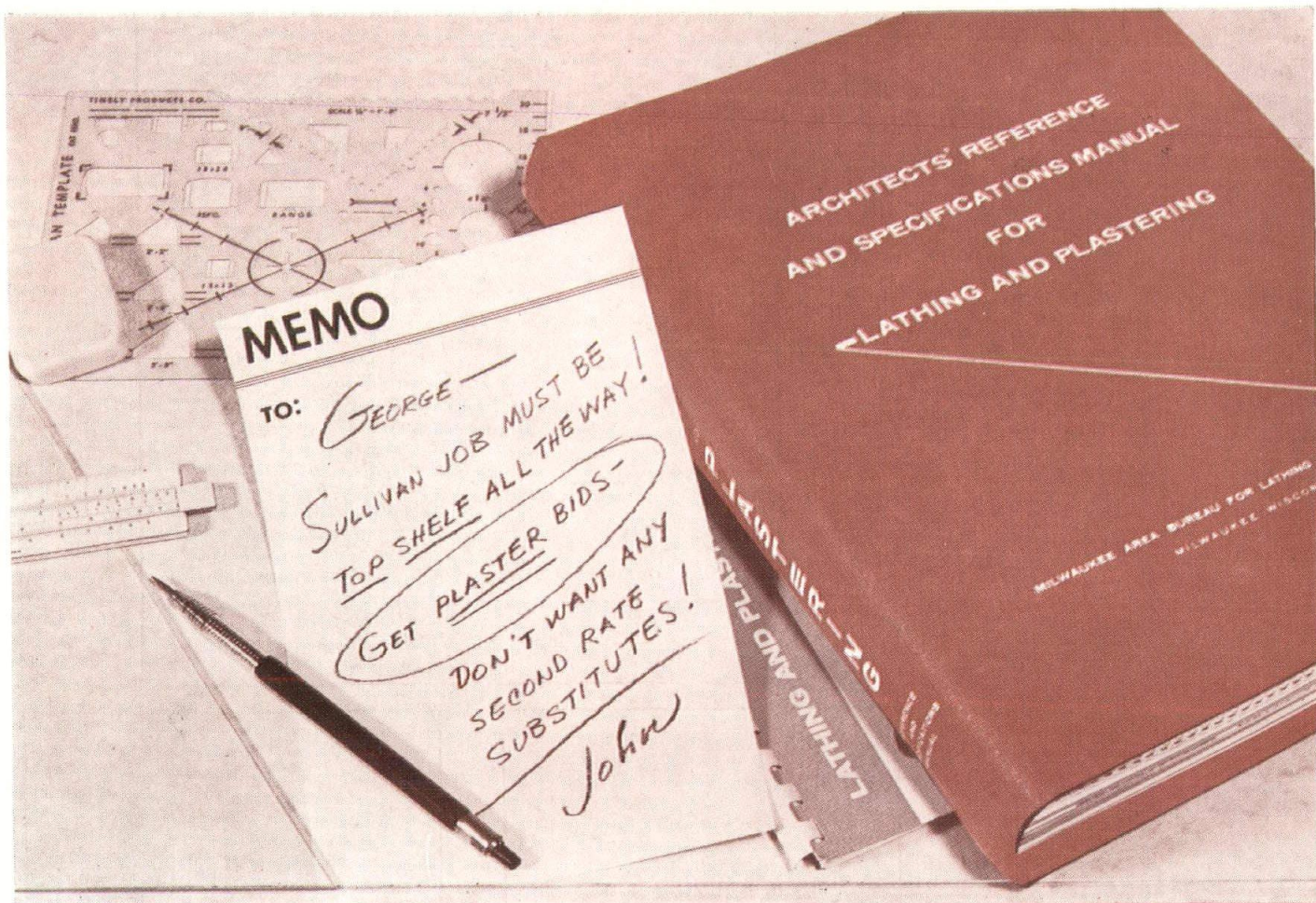
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